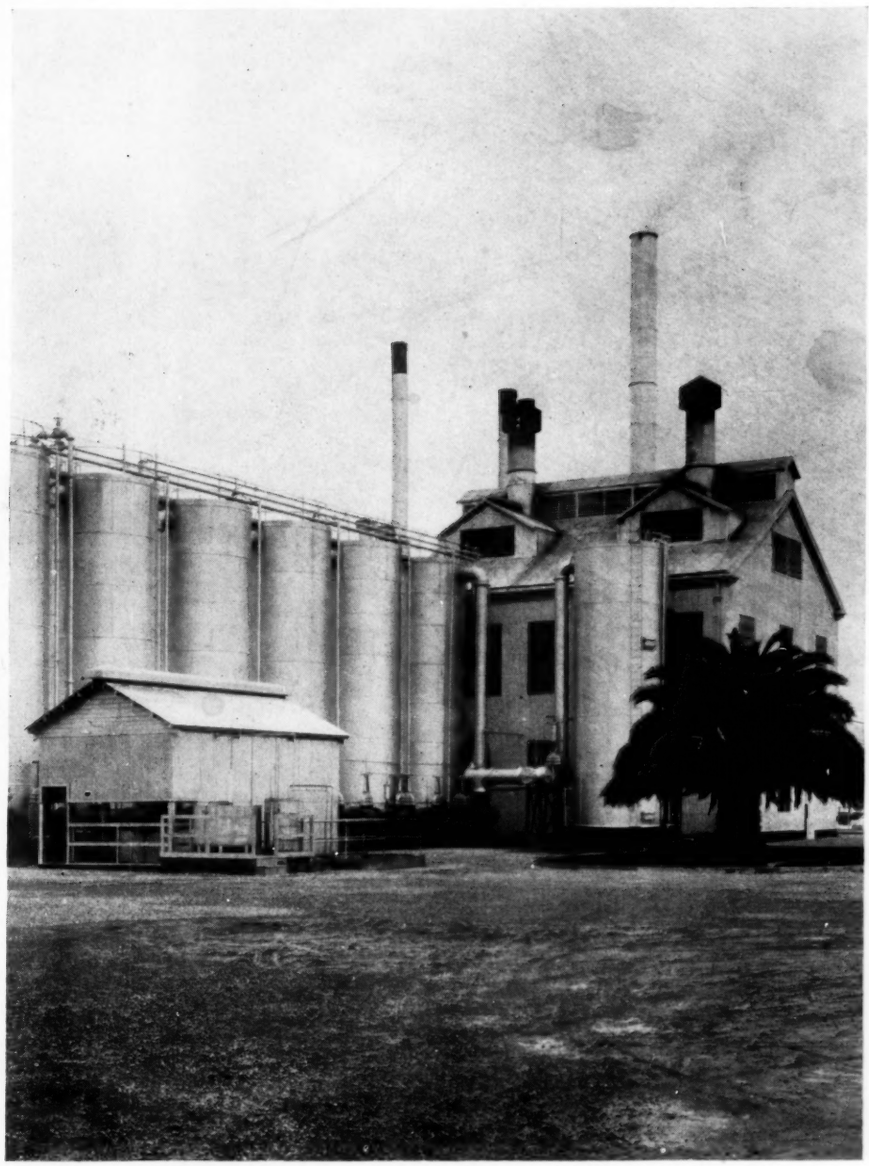
WESTERN GAS

March
1928

20 Cents
the Copy



San Rafael, Calif., gas plant of Pacific Gas and Electric Company, rated first for production plant class in that Company's 1927 property appearance competition

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

Announcing Type R

Nordstrom Valve

Low in cost
Lubricated.
Small sizes.
Especially desirable
FOR
Curb & Meter Service

Now you can obtain the standard plug cock type of valve, with the **Nordstrom lubricating feature,** in the smaller sizes at **very reasonable cost.**

The Nordstrom **Type R** Valve, incorporates our new patented "Sealdport" lubrication, which efficiently seals both ports, and yet allows the plug to be turned through 360° without permitting the line fluid to escape from the valve, and lifts the plug by lubricant pressure.

It is designed to fill the need for a Nordstrom Valve for the less severe services, and is recommended for air or water, up to 100 lbs. or gas and gasoline up to 50 lbs. Its cost is low. Can be had with wing lock or extension head.

Sizes ¾", 1", 1¼", 1½"

Ask for complete information

MERCO

TRADE MARK

MERCO NORDSTROM VALVE CO.
Subsidiary of THE MERRILL COMPANY
Engineers—Manufacturers

San Francisco.....121 Second St.
Cleveland .....Engineers Bldg.
New Orleans.....Masonic Temple Bldg.
Chicago.....Peoples Gas Bldg.
New York City.....11 W. 42nd St.
Houston .....Petroleum Bldg.

Factories: Oakland, Calif. and Belleville, N. J.
Agencies in Princ pal cities.

A New Factor

in

Appliance Merchandising

HOT-N-KOLD

AN extensive sales plan embracing the whole of Northern California has already been launched by the **Hot-N-Kold** Corporation, a mother company for **Hot-N-Kold** Shops that will operate in San Francisco—Oakland—San Jose—Fresno—Stockton—Sacramento.

Hot-N-Kold franchises will be available for dealers already established in other communities.

For the first time in the history of gas and electric appliance merchandising, the dealers will be enabled to engage in merchandising on the same basis as the Public Utilities.

A **Hot-N-Kold** Franchise gives you the exclusive right to:

Hot-N-Kold Advertising

Hot-N-Kold Merchandising Assistance

Hot-N-Kold Financing of Sales

THE HOT-N-COLD CORPORATION

C. H. Dickey, Jr., Pres.—W. D. Dickey, Secty.-Treas.

973 Mission Street, San Francisco

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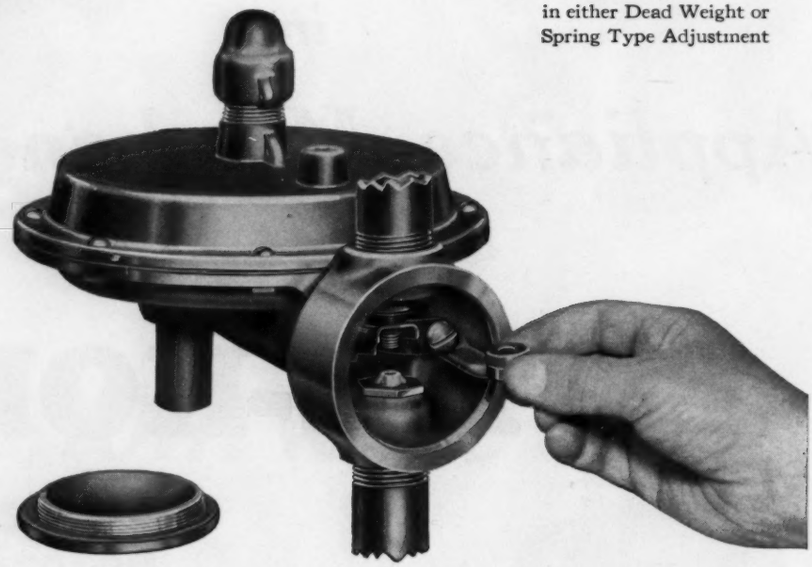
RECOGNIZED LEADERSHIP IN

MODEL 10 SERIES

For service in the PIPE LINE

MODEL 10 SERIES
with or without
Mercury Seal
in either Dead Weight or
Spring Type Adjustment



All working parts accessible and interchangeable while in pipe line!

YOU can save many hours of productive labor; speed up installation time; cut installation costs and realize new and better performance with the Reynolds *Model 10* Series. Every working part in the Model 10 may be removed while in the pipe line and every working part is so accurately made that it is always interchangeable.

Reynolds Products are built to enable you to render your customers the greatest possible trouble-proof service. It will pay you to investigate the possibilities of making Reynolds equipment standard throughout your system.

Representatives:
EASTERN SERVICE COMPANY, BOSTON, MASS.
F. E. NEWBERRY, AVON, NEW JERSEY
THOS. C. CORIN, DETROIT, MICHIGAN

Reynolds Products

for all kinds of Pressure Reduction—for either artificial or natural gas.

Governors—
Intermediate Pressure
Triple Outlet
Holder
Toggle Type Street

Regulators—
High Pressure Service
Low Pressure Service
Intermediate Pressure
High Pressure Line
Single and Double
District Station

Valve—
Automatic Quick-Closing
Anti-Vacuum

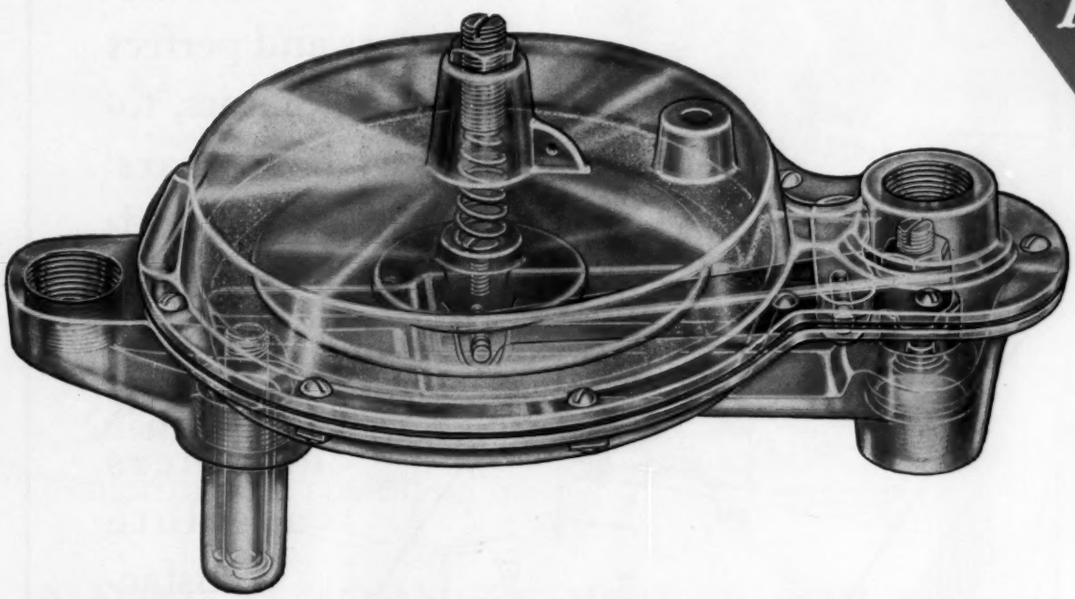
COMPANY MEMBER OF AMERICAN GAS ASSOCIATION INCORPORATED 1918

GAS CONTROL SINCE 1892

MODEL 20 SERIES

For service at the PLANT

MODEL 20 SERIES
with or without
Mercury Seal
in either Dead Weight or
Spring Type Adjustment



Working parts so accurate as to permit complete interchangeability in shop . . .

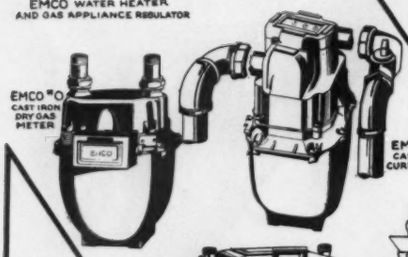
also assuring perfect location of valve to orifice

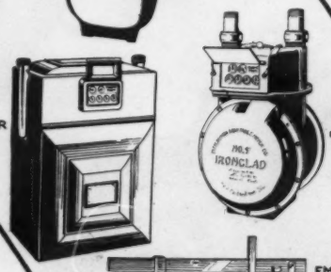
MODEL 20 Series—a companion Governor to the Model 10 Series—was designed to increase efficiency of the plant that services all equipment in the shop. *Model 20* Series is the result of constant experiment and thorough testing during the past two years. Increased efficiency in operation—all working parts so accurate that they are completely interchangeable*—means small service stocks. All working parts are rust-proof, reducing need of attention. Engineers will appreciate the accurate, efficient Reynolds *Model 20* Series—the cost will interest purchasing agents and customers will be satisfied. Complete data on Reynolds Service Governors on request.

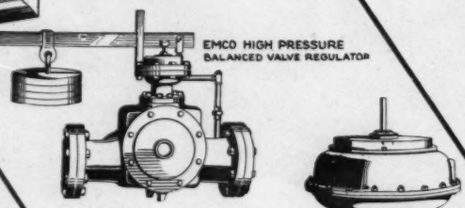
*Ordinary repair parts for Series 20 are interchangeable with parts for the old-type service governor. We will continue to supply plants desiring old-type service governor.

Reynolds
Gas Regulator Company
Anderson, Indiana
Established 1892

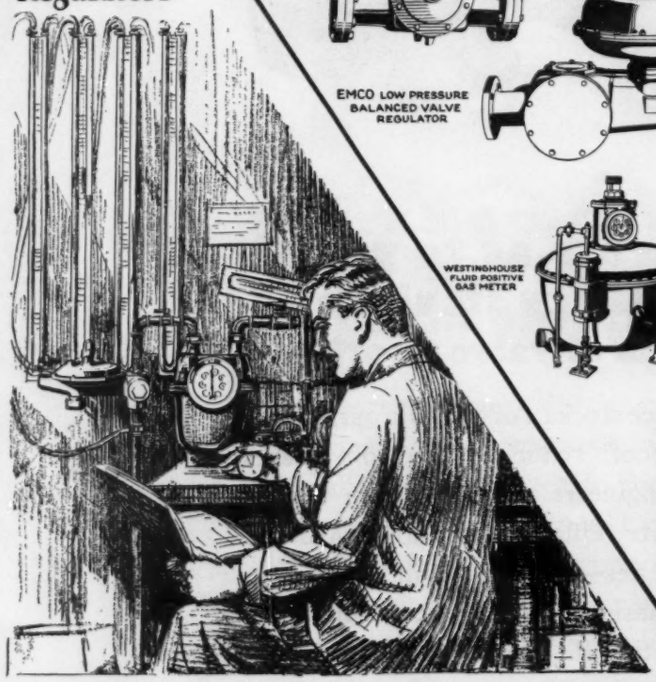
EMCO WATER HEATER AND GAS APPLIANCE REGULATOR

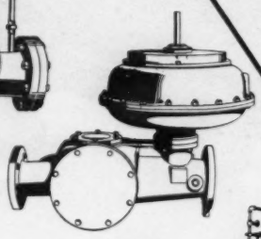


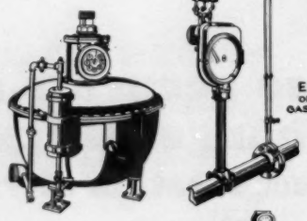


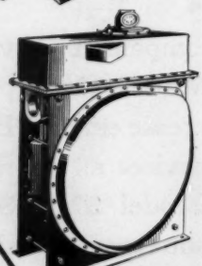


Testing Domestic Service Regulators









Design Principles

A careful study by our Engineering Department of proper principles for accurate measurement in meters and perfect control in regulators, together with 30 years' experience in building equipment for the Gas Industry assures to our customers absolute satisfaction.

PITTSBURGH EQUITABLE METER COMPANY

MAIN OFFICE AND WORKS PITTSBURGH, PA.

NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS
TULSA SEATTLE KANSAS CITY SALT LAKE CITY

Shell Oil's
new 100 mile
gasoline pipe line
insures
against corrosion

The Longest natural gasoline pipe line in the WEST
100 MILES of 4-inch and 6-inch
American Seamless Slip-Joint Line Pipe
The 100-mile natural gasoline transmission line, built by the Shell Company of California and extending from its plant in Ventura, California, to the refinery at Wilmington, is a significant tribute to American Seamless Slip-Joint Line Pipe.
The line consists of 85 miles of 4-inch pipe, the balance being 6-inch. Joints average 40-feet in length, giving an economical welding total. The lightness of the pipe facilitated speedy handling throughout. No difficulty was experienced in welding the high carbon steel.
Two mountain ranges were crossed with this line: one at Santa Susana Pass, elevation 1,650 feet; and the Santa Monica Mountains, elevation 1,300 feet. Some idea of the difficulties encountered may be gained by reference to the illustrations, and the profile of the line, reproduced here.
AMERICAN SEAMLESS TUBE CORP. OF CALIFORNIA
PETROLEUM SECURITIES BUILDING
LOS ANGELES, CALIFORNIA
535 Fifth Ave. New York City
1211 Neils Esperson Bldg. Houston, Texas
When this Line Was Built the Best Pipe Was Essential

30 MILE SECTION IN WORST SOIL PROTECTED WITH BITURINE ENAMEL

From Ventura, California, to the refinery at Wilmington—nearly 100 miles—runs the Shell Oil Company's new natural gasoline pipe line. Laid in a variety of soils, some highly corrosive, it is significant to note that the 30 miles section laid in the worst soil was protected with Biturine Enamel—the permanent corrosion preventive.

Biturine Enamel prevents corrosion permanently

For over sixteen years leading oil and gas industry executives have been putting their pipe line corrosion problems squarely up to Biturine Enamel. In all cases it has given permanent protection.

Impervious to acids, alkalis, electrolysis

Biturine Enamel is a heavy quick-setting bituminous coating, tough but not brittle. Applied hot it is a complete coating, requiring no wrapping. Impervious to corrosive elements in the soil.

Biturine Enamel is but one of a special line of paints and coatings manufactured by Hill, Hubbell & Company for the oil industry.

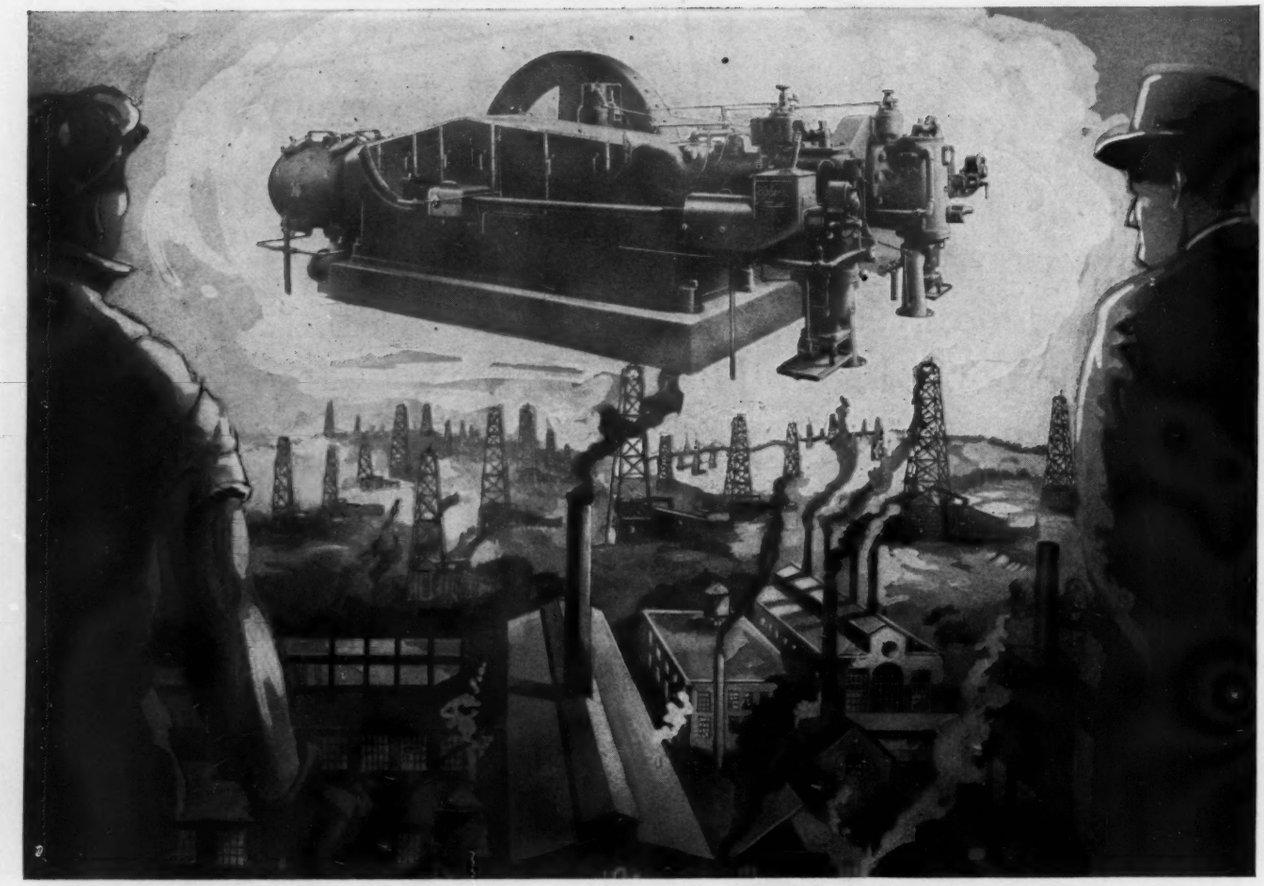
Biturine Enamel is supplied with directions. No skilled labor necessary. Valuable, practical data and specifications on request.

HILL, HUBBELL & COMPANY

Manufacturers of
Highest Grade Oil Industry Paints and Pipe Line Coatings
Factories at SAN FRANCISCO and TULSA

District Offices:

LOS ANGELES **HOUSTON** **NEW YORK CITY**
SEATTLE **PORTLAND** **BALTIMORE**



"Mr. Lewis and Joe Choose an Engine"

Mr. Lewis, superintendent of the gasoline department, and Joe Rolland, head engineer at the compressor station, look at an engine from slightly different viewpoints.

Mr. Lewis thinks of the balance sheet at the end of the year and how it may be affected by investment charge, maintenance costs, fuel consumption, lubricating oil consumption and last, will his choice ever cause his associates or friends to say: "Well, you will remember I advised buying a different engine."

Joe thinks in terms of the work required to keep the engine on the load day after day. Are adjustments easily made? Will there be frequent messy replacements to make? Will he ever need to defend his choice with his boss?

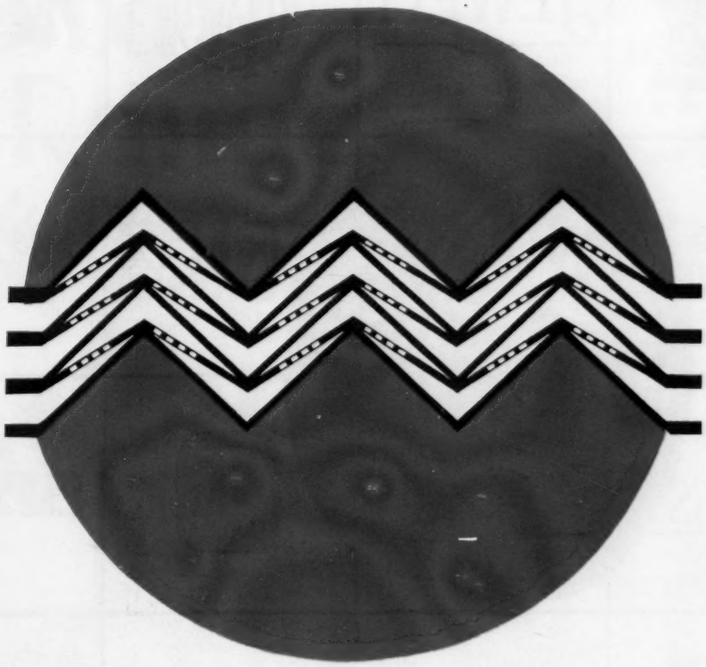
The steadily increasing sales record of Cooper engines and compressors is the surest indication that men in both positions prefer to play safe by choosing Coopers.

THE C. & G. COOPER COMPANY

Dallas, Texas Mt. Vernon, Ohio Los Angeles, Calif. Tulsa, Okla.

COOPER

THE PIONEER



SEPARATOR

For the complete separation of liquids and solids from air, gas, steam or other vapors

The PIONEER SEPARATOR separates completely, liquids from gases, by employing several thousand times the following primary methods: 1. Baffling; 2. Centrifugal force; 3. Sudden changes in the direction of travel; 4. Sudden changes in velocity.

Complete Separation—Minimum Back Pressure—Reliability

Maximum Separation Efficiency

Pioneer Equipment Corporation

OF AMERICA

231 Broadway

California Representative
H. E. Plummer
806 Fife Building
San Francisco, Calif.

New York

JEWEL STOVES AND FURNACES
DETROIT STOVE WORKS
LARGEST STOVE PLANT IN THE WORLD

JEWETT

MAGEE

Monarch MALLEABLE

ERIEZ

STOVES SUMMIT RANGES FURNACES

PEERLESS

T TAPPAN

SPARK

RED CROSS RANGES & FURNACES

Crawford Gas Ranges

ANDES

Paramount MALLEABLE

WHERE is the woman who does not yearn for the conveniences afforded by a gas range equipped with a modern oven heat control? She simply doesn't exist.

Think of the merchandising possibilities here and then follow the history of the Wilcolator which is today the standard oven heat control on over 90 makes of gas ranges.

Wilcolator on your gas range is a sales asset that builds increasing good will with years of service.

Ask us to send you Bulletin No. 204 for details.

The Wilcolator Company
17-23 Nevada Street, Newark, N. J.

W I L C O L A T O R
OVEN HEAT CONTROL

Vivid, colorful Estate Gas Ranges *to satisfy the modern demand for gay kitchens*

STYLE in a gas range! Yes, these new Estates have more than an appeal to the practical. Thousands of gas ranges designed in the "dark ages" will be quickly replaced with these vivid, colorful Estates in Jade Green, Mandarin Red and King's Blue, because they are smart — modish.

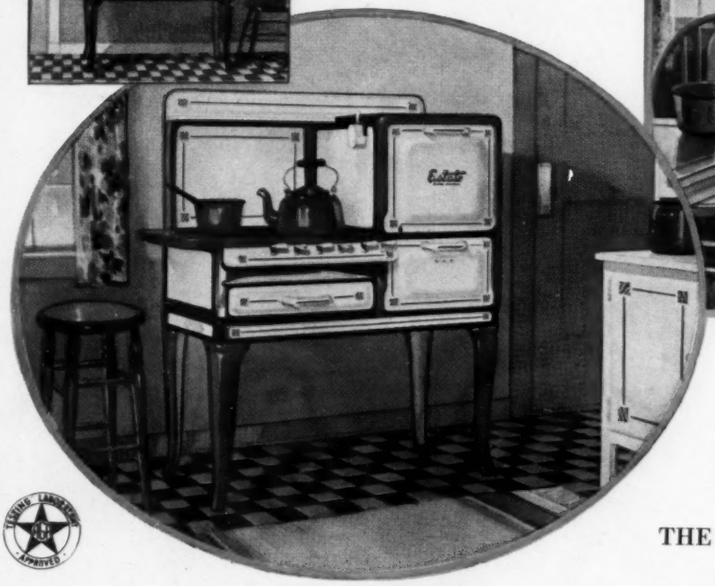
You have seen the swift sweep of color into popularity. So you can readily see what an appeal there is in these gayly-colored ranges. Especially since they are Estates with the wonderful Fresh Air Oven and other famous features.

Gas companies and dealers, the country over, are reporting lively sales. Many of them write us that these colored Estates have created a sensation in their towns. Crowds before their windows — crowds inside their stores. May we send you the details?

JADE GREEN

KING'S BLUE

SLENDER, graceful — without a nut, bolt or hinge to mar the gleaming surfaces.



MANDARIN RED

For the Pacific Coast,

Estate Gas Ranges are furnished with solid cooking top and in-built kitchen heater.

THE ESTATE STOVE COMPANY, HAMILTON, OHIO

House Founded in 1845

180 New Montgomery Street
San Francisco, Cal.

Terminal Sales Building
Portland, Oregon

Estate GAS RANGES

. . . with the "double boiler" oven that bakes with FRESH AIR

"it delivered the goods"

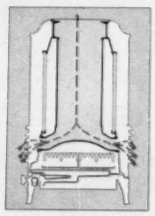
THIS WINTER was the first season for the Estate Gas Heatrola. The test season, you might call it.

We, who created the new Heatrola, were confident of its performance both in a sales way and a heating way. And now, after a season's experience, gas men as well as consumers tell us that "it delivered the goods."

We appreciate the many fine things said about the Estate Gas Heatrola and we are happy that so many companies have been successful with it—the very first season.

Really, the Gas Heatrola was a logical development. The time was ripe for a better method of heating small homes with gas. So it is not surprising that this beautiful heater, which circulates healthful warmth throughout three to five connecting rooms, met with such immediate success.

Right now is a good time to give the Gas Heatrola consideration for fall selling. We will be glad to send you complete information so that you may weigh it from every standpoint.



AMONG the many features of the Gas Heatrola is the exclusive Intensi-Fire Air Duct — heart of Heatrola's double air-circulating system. This ingenious device blocks much of the heat that the ordinary heating device allows to escape up the chimney, and practically doubles Heatrola's heating capacity.

In addition, the Heatrola boasts of a burner entirely new in principle, and marvelously efficient, housed in an absolutely fume-tight heating unit of original design.

Of course, the Estate Gas Heatrola wear the Blue Star of A. G. A. approval.

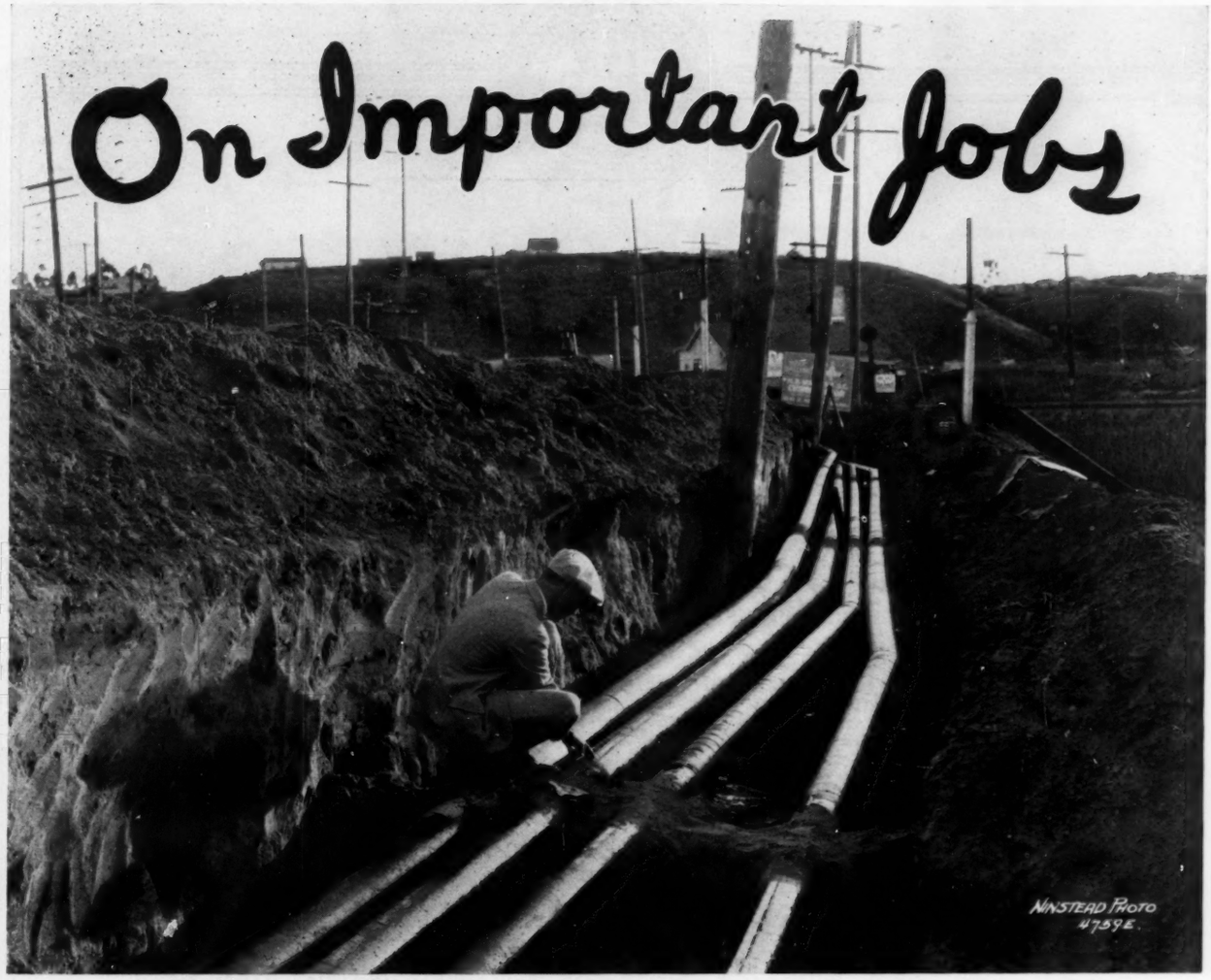
THE ESTATE STOVE COMPANY, HAMILTON, OHIO, *House Founded in 1845*

180 New Montgomery Street
San Francisco, Cal.

Terminal Sales Building
Portland, Oregon

Estate GAS HEATROLA

There is only ONE Heatrola—ESTATE builds it



The Pan-American Pet. Co. Pipe Line Through Salt Slough, Between Wilmington and San Pedro

"McEVERLAST"
Is
Complete Protection

"McEVERLAST" Electrolysis Proof Coatings are also proof against moisture, alkali, gas and acids; they do not become brittle and will stand rough handling without effecting the surface. Many of the largest industrial concerns in the Southwest are extensive users of **"McEVERLAST."** Their names will be furnished you upon request.

We have just published an interesting booklet, covering our Electrolysis Proof Coatings, heat resistant coatings, lacquers and general **"McEVERLAST"** line of waterproofing products, which is yours for the asking.

Everlasting Paint and Sales Company

1110 Board of Trade Building

Phone TRinity 3196 Los Angeles

The Improved "B" Meter

Important improvements in the general mechanical construction of meters have been effected during the past decade

MOST important of these are the much-sought-for results achieved by the Gas Engineers in the development of the present "B" type meter.

The Modern "B" Meter maintains the same high quality of workmanship and materials and furnishes the Gas Industry with a meter eliminating as far as possible wear on moving parts and lost motion, a meter possessing longer life and service with more accurate registration—yet with no increase in selling prices.

IN the improved "B" meter, or so-called "Slow Speed" meter, the speed ratio is maintained at the same rate as the old-style meter, but more important even than the speed ratio is the fact that the capacity of the meter is not increased so greatly as to necessitate an abnormal increase in the *actual* running speed of the meter to produce results required under its rated capacity.

It is so constructed as to take, for reasonable periods when required, an overload 50 per cent greater than the rated capacity, thereby providing for the peak load.

Pacific Meter Works

of the
American Meter Company, Inc.
Northwestern Representative

SAN FRANCISCO
495 Eleventh St.

PORTLAND
Northwestern Gas and Electric Equipment Co.

LOS ANGELES
2118 Atlantic St.

A beautiful new gas range makes days easier for you

A beautiful new gas range with its enameled surfaces will harmonize with almost any decorative idea you have. These ranges are finished in white, gray or several pastel-colored enamels finished to order. There are many models. That makes it easy to have a good gas range that fits a space nicely.

The cleanliness of the new gas range helps keep the kitchen clean. The glossy surface wipes clean with a moist cloth. The closed top is easy to clean when foods boil over. It keeps your cooking utensils like new. You can have colorful curtains, colorful walls and flowers in your kitchen.

For convenience and good baking the new gas range has the oven heat control. It watches the oven-cooking while you're downtown. All the better gas ranges have this device, so if you select your new range from among these, you're sure of a well constructed range with a perfect baking oven. Such a gas range makes days easier for you.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed by Californians

206-128

Reproduction of a 3-column, 8-inch newspaper advertisement

How does a woman buy a gas range?

When a woman buys a gas range she thinks of its appearance—Has it beautiful lines? Is it finished attractively? Will it harmonize with her idea of a good looking kitchen? Is the range modern?

Second, she wants to be sure of its cleanliness—Can the enamel be wiped clean with a moist cloth? Does the range keep cooking utensils clean? Will it help keep the whole kitchen clean?

She is interested in the Oven Temperature Control when she learns it makes baking easier.

Gas range advertising that tells women things they want to know helps everyone sell more ranges. That is why we're running the advertisement pictured above in the newspapers this month.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed
by Californians

A Page *from*

IN the interests of simplifying the work of the gas company, Welsbach has created an unusual instruction card for the purchasers of the Hotzone Self Action Water Heater . . . In a good natured way the folder acquaints the new owner of a water heater with the "do's and dont's" of operation. Already this little folder has aided in the general work of making well-satisfied customers for gas companies . . . The idea itself is indicative of Welsbach's continuous effort to aid its customers in reducing sales resistance and increasing good will. Samples of "Welcome, Member" will be gladly sent on request. Welsbach Company, San Francisco Office: *863-865 Mission Street*

Member of American Gas Association
Member of Pacific Gas Association

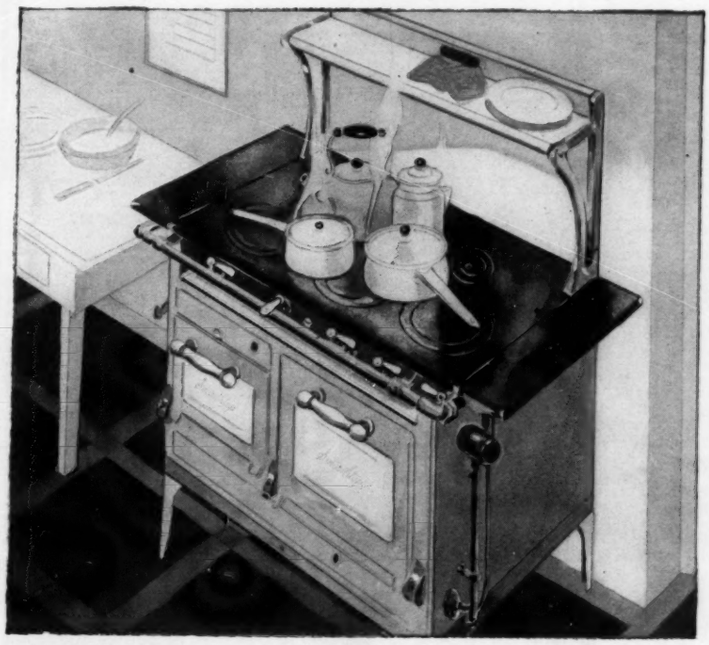
The Reading of the By-laws

As this is a family membership, it is recommended, in the interest of perfect satisfaction, that the family treasurer read aloud to the newly initiated the following by-laws. And thereafter seek their unanimous adoption.

1. No member shall turn on the hot water faucet when cold will suit his purpose just as well.
2. All members shall see that the hot water faucets are turned off tight after using.
3. Any member who discovers a leaky faucet shall report the same to the family manager immediately.
4. All members shall mix cold water with the hot in order to get the right temperature instead of drawing twice as much hot water and then waiting for it to cool.
5. Any member breaking the above rules shall be immediately demoted to the end of the bathroom line.

The **WELCOME MEMBER** *folder is attached to every* *Welsbach* **HOTZONE**

SELF ACTION GAS WATER HEATER



Here's the 8 Feature Story that gas men are talking about

THE talk of the day among gas men is Smoothtop, its eight feature story and method of training salesmen.

The experience of the Consolidated Gas Company, which sold 750 Smoothtops in one month (see Gas Age Record, February 18th) and others has proven conclusively that wherever salesmen have been properly instructed in this sales story their sales have shown an immediate and sustained increase.

Here's a summary of the story:

1.—THE TOP

(1) Easy to keep clean.
(2) Good looking.
(3) No oven to obstruct light.
(4) Vessels cannot tip.
(5) No oven in the way of the woman at work.
(6) Holds twice the vessels; holds long-handled pans.
(7) Protection to burners—no cleaning of burners.
(8) Has twice the cooking space.
(9) All of the top is cooking space.
(10) Top built in sections—prevents warping and cracking.

2.—THE COOKING METHOD

Cooking by Zones of Evenly Distributed Heat Over Entire Surface of Top.

(1) Rapid or vigorous boiling.
(2) Simmering or slow boiling.
(3) Warming.

3.—ADVANTAGES OF COOKING METHOD

(1) Direct-flame cooking—only method of cooking to be had by open top.
(2) One burner meal.
(3) Simmering or slow cooking:
  (a) Waterless cooking.
  (b) Sauteing.
  (c) Slow stewing or boiling of meats.
(4) Warming—while waiting.

4.—OVEN

(1) Uniform circulation.
(2) Heat control with time and temperature chart.
(3) Position.

5.—BROILER

(1) Size.
(2) Convenience and height.
(3) Thorough heat distribution.

6.—HEIGHT AND CONVENIENCE

7.—SIZE AND ADAPTABILITY TO ANY FLOOR SPACE

8.—BEAUTY

Let us tell you how Smoothtop, the eight-feature story and our plans for training salesmen will produce a larger volume of gas range sales for you.

Have you seen the full page Smoothtop advertisements appearing in Good Housekeeping Magazine?

Northwest Gas and Electric Equipment Co.

Pacific Coast Distributors, Standard Gas Equipment Corp.

Public Service Bldg.
Portland, Ore.

2nd & Brannan Sts.,
San Francisco, Calif.

164 So. Central Ave.
Los Angeles, Calif.

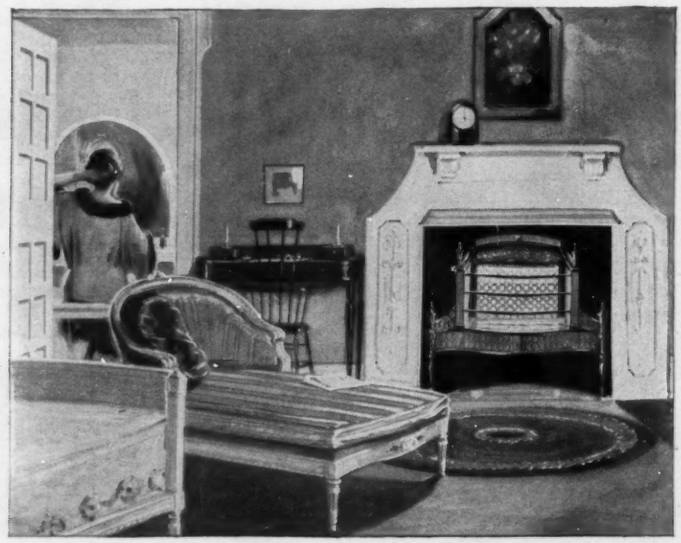
No. 45

No. 30

No. 25

No. 115A

No. 80

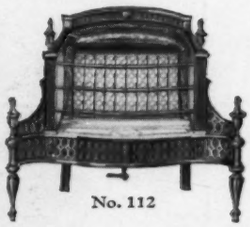


For Every Purse

A gas appliance can be made so cheap that it is not safe, nor efficient, nor good to look at. Humphrey never has and never will make an appliance that cheap.

But there are models in the big Humphrey Radiantfire line which cost as little as a man can pay to get a satisfactory heating unit; many models in the moderate price range; and others to suit fastidious tastes and larger purses.

In fact, a model for *every* purse.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No. 60

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San Francisco

WESTERN GAS

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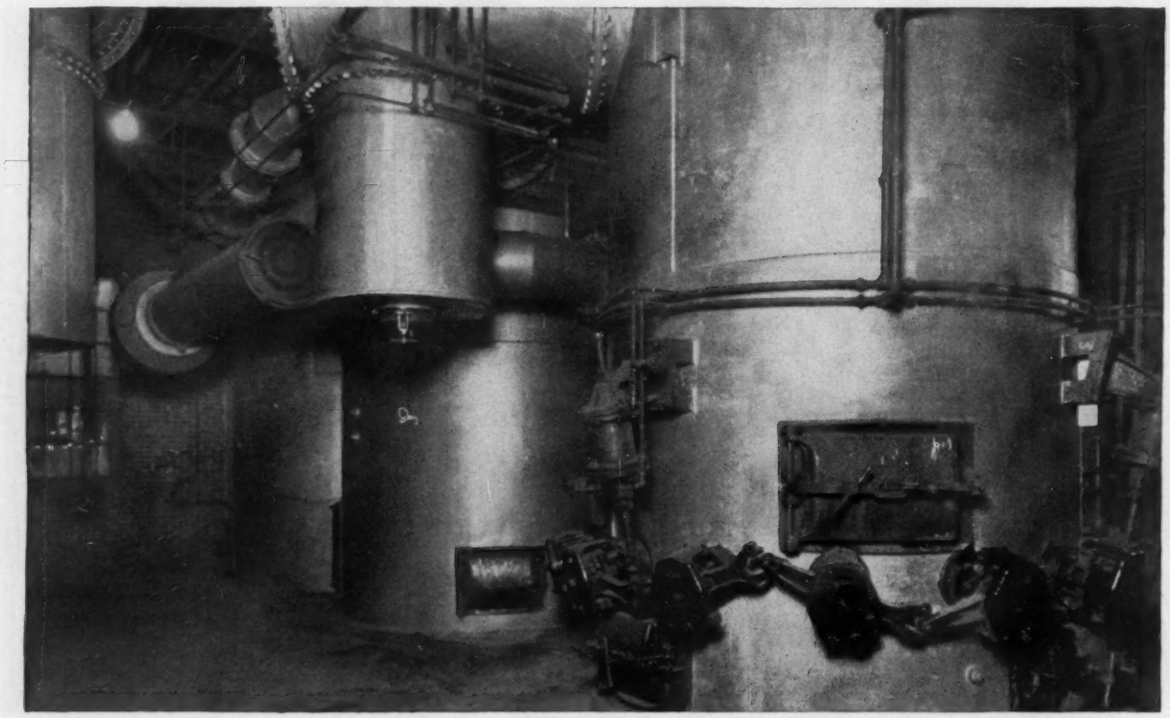
13 Days to Erect Steere Water Gas Machine with *Rolling Grates*



Patent applied for

Clinker floor view of 10′ Steere Water Gas Machine, erected in 13 days.

December 26, 1927—We began clearing foundations for a 10′ x 10′ x 10′ Steere Water Gas Machine, equipped with hydraulic poker and ***Steere Rolling Grates,*** for the Illinois Power Company at Springfield.

December 31, 1927—Erection work was started.

January 12, 1928—Erection work was completed. Actual erection time was 13 days.

Steere Water Gas Machines have upset all traditional standards for capacity and performance.

If you need anything in a hurry we can give it to you.

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WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in *Western America*

SAN FRANCISCO LOS ANGELES DALLAS

The Coast Sales Conference

By GEORGE H. FINLEY

ALL the aspects of an annual convention were seen in the Pacific Coast Gas Association's Southern Regional Conference, which took place on February 23, 24 and 25, in Los Angeles, sessions being in the Los Angeles Gas and Electric Corporation building auditorium. Although the fact that the regional meeting of the west coast group was combined with a Pacific Coast Sales Conference, jointly sponsored by the Pacific Coast Gas Association and the American Gas Association, had something to do with the large attendance, the P. C. G. A. Section sessions would have done credit to an annual meeting in themselves.

President L. M. Klauber took up the gavel for the first general session of the conference at 2:00 p. m. Thursday, February 23, reading a telegram from A. G. A. Headquarters, expressing the national association's interest in the meetings then transpiring. Thursday morning was given over to simultaneous meetings of the Accounting, Public Relations, Commercial and Technical Sections. Good attendance and lively discussion marked these Section meetings, which gave opportunity for progress reports from committee chairmen, as well as for the formal programs put on by the Technical and Public Relations groups.

Four addresses made up the Thursday afternoon general session, the first by C. A. Gummere of the Industrial Business and Service Organization, Los Angeles, who took for his topic the subject "Improved Methods Make Men Dear and their Product Cheap." The speaker applied his major premise to two fields, machinery and methods. Another of his basic generalities—"It is not what we say, but how we say it, that counts," —held more than a grain of truth for the utility operator.

"Public Relations from the Consumer's Viewpoint," was the theme of Dr. W. D. Moriarty, Professor of

C. O. G. Miller

Economics, University of Southern California, who was introduced by D. L. Scott, doughty head of the P. C. G. A. Public Relations Section. Said Dr. Moriarty, "The battle for the good will of the consumer is won on the skirmish line, not on the battle front"—his expressed implication being that the utility operator sends his best forces against organized opposition, but places less attention upon the day-to-day contacts with the gas-using public.

Turning from theory to practice, the next feature was a review of the Los Angeles Gas and Electric Corporation's experience in conducting a house survey of gas appliances, incident to the recent change-over to natural gas service. A. R. Bailey and W. F. Brandt of the above company collaborated in this number, which was presented under the title, "The effect of Inferior Appliances on the Gas Load." This practical paper will be found on another page of this issue.

Graham Hughes, advertising counsel for the Southern California Gas Company, spoke next on "Modern Merchandising Methods for Gas Companies." Mr. Hughes, from the viewpoint of his craft, which plays so essential a part in the marketing of the world's goods, developed a hypothetical set-up for a year-round campaign on appliance sales along lines of good commodity merchandising practice.

On Thursday evening came the "Speechless Dinner Dance," held at the Chamber of Commerce Building in Los Angeles, and accorded an attendance of 275. An efficient committee comprised of L. H. Dell, Southern California Gas Company; Larry Raymond, Southern Counties Gas Company; and Wm. Maddock, Los Angeles Gas and Electric Corporation, had charge of arrangements for the dinner dance.

Some 300 were present when the Pacific Coast Sales Conference officially opened on Friday morning at 9:30, with a "Symposium on the Industrial and Commercial Load." President Klauber introduced A. B. Day, who as executive

(Continued on Page 32)

What *the* Blue Star Means

By K. H. FLINT
Inspector, American Gas Association Appliance Laboratory

¶ It would be surprising to say the least if, in the bettering of a situation as complicated as was that of the gas appliance industry at the inception of the American Gas Association's Testing Laboratory, there were not a few misunderstandings to clear up. The only surprise feature is that there has not been more friction to overcome in the pursuit of the Laboratory program, which in the past three years has unfolded to a remarkable extent.

¶ However, since there is an occasional instance where some element of the industry loses sight of the Laboratory's purposes, the statement appearing on this page is a timely one. Mr. Flint's remarks, made during the Pacific Coast Sales Conference held at Los Angeles in February, comprise a clear summary of Laboratory objectives, and the reader may refresh his mind not only upon "what the Blue Star means," but also upon what it does *not* mean.—*Editor.*

IT has become obvious in the past few months that a large number of appliance manufacturers and gas company men have a mistaken idea of the exact meaning of the Blue Star of Approval. It has been the habit of a number of salesmen to use the seal as a marking, indicating the monetary value of the appliance that uses it. That this idea is incorrect I wish to emphasize in my talk today.

The men who founded the Laboratory had no such thought in their minds and charged the Laboratory on its founding with the accomplishment of the following four major purposes:

First—The raising of the standards of performance and construction of gas appliances.

Second—The elimination of hazardous and inferior types of equipment at the earliest possible date.

Third—The creation of greater confidence on the part of the gas consuming public in the merits of gas burning equipment.

And fourth—The securing of the cooperation of gas companies and dealers in merchandising only approved types of equipment.

The accomplishment of the above purposes has been the aim of the Laboratory since its founding three years ago and the results have been most gratifying.

Our appliance committees have never favored the adoption of any standard that might in any way restrict inventive genius or initiative. That development in the gas appliance industry should be encouraged will be agreed to by everyone here. Therefore, why should we restrict any manufacturer to a basic construction just because nothing better has been brought forth up to the present time? For this reason our construction requirements have been held down to just those that are necessary to insure safety to the consumer after the appliance has been in operation for a considerable length of time. We do insist on reasonable durability of all parts of the appliances and upon a high standard of workmanship and assembly. No appliance is approved that is constructed of such cheap material or light weight metal that it might in any way endanger its users.

Our standards have sometimes been classed as minimum requirements. In a way this is unfortunate as minimum to the average person, indicates a low standard. While it is true that our requirements do indicate the minimum performance allowable, that minimum is very high as far as safety is concerned.

It has never been the intention of any committee to compromise where the factor of safety enters into the requirements. Not only are the appliances required to perform safely on pressure fluctuations fifty per cent above and below the standard pressure without compensating adjustment, but they are also required to perform safely on gases with a wide variation in specific gravity and B.t.u. content. The gases used for our tests are the result of an investigation wherein tests were run using the exact duplicate of gases sold in a number of the larger cities throughout the country. These gases duplicate the extreme conditions that an appliance is liable to meet when in use. Therefore, although appliances are not tested on the specific gases used in various localities throughout the country, we can be reasonably certain that they will perform safely under any conditions they may meet.

The Blue Star signifies that the appliance on which it is placed, if properly installed and correctly adjusted, will operate safely and efficiently under normal conditions of service. This statement I believe is the one that should be emphasized when telling the public the meaning of our seal. To raise the standards of safety and efficiency to the highest degree is the ultimate aim of the Laboratory. Further, the Blue Star indicates that the essential features of the appliance are of such material, weight and thickness that they will insure reasonable durability. It is in this statement that most of the misunderstanding exists. While our standards insofar as they refer to construction are basic, a survey of our test records indicates that very few manufacturers exceed them. To have set these standards higher would have seriously disrupted our appliance manufacturing process. Therefore, as far as our requirements apply, the only difference in the final cost of a finished appliance should lie in the quality of workmanship, the quality of material, the number of accessories supplied, the finish or trim and the economic factors governing the manufacturing processes. Of these various items the Laboratory could logically interest itself only in the first one, the quality of workmanship. As far as this is concerned the recent inspection of all manufacturers of approved appliances showed that there are no vast differences in workmanship and assembly and that sometimes the quality of workmanship is higher in the plants of the smaller manufacturer.

IS IT not just as important that the customer who on account of his financial condition can not pay a high price for an appliance be insured of a safe and efficient product as well as the buyer of a higher priced article? If we are to insure safe and efficient operation of appliances to the whole buying public we must protect the large percentage of our consumers whose financial condition prevents them from buying a very high priced article. Therefore we must interest ourselves as much in the cheaper appliances and bring these up to standard. The statement has been made by some manufacturers that the application of our standards will have a leveling effect on appliance construction. Assuming for the moment that such statements were true, is it not better that the Laboratory has brought the

(Continued on Page 66)

This Blue Star Plan

By CAPT. A. E. HIGGINS
Blue Star Representative, American Gas Association

WHILE I do not think it necessary to go into details regarding the Laboratory in this discussion, I do want to point out that tested and approved appliances are the basis on which this sales plan is built. It gives us a definite background and solid ground on which to stand while developing our merchandising plan.

All of us recognize the fact that when we have removed from the market all but tested and approved appliances we have also reduced our service cost and increased our customers' good-will.

But, in order to increase the sale of appliances and output of gas, we must go further and popularize the use of gas with the public—we must create new uses for gas, new fads, new styles—in short, we must make people demand the fully gas equipped house for their home. We must point out the convenience and comfort of such a home.

Where should we start with such a campaign? Where, but with the builder of new homes—the architect, the builder and contractor, plumber, etc.

Probably all of us here recognize that gas is the cleanest, most reliable and convenient domestic fuel for cooking, water heating and room heating, as well as other household uses. In nearly every case it is also the most economical fuel, particularly if provided for at the time of the erection of the building.

The cost of adequate piping, when installed at the time of erection, is very much less than the increased value of the premises so equipped, and is relatively small compared to the total cost of the building.

If, on the other hand, it is necessary to install the piping after the building is complete, the cost is greatly increased, the installation is liable to be unsightly and the necessary work a source of annoyance to all who occupy the building.

This means that if the architect or builder is to provide his client with the conveniences and comforts of the completely equipped gas home, he must make provision for adequate piping and ventilation at the time of erection of the house, in order to secure these conveniences at the lowest cost to his client. You all know that if new houses were built with proper pipe, proper outlets, proper flues and ventilators, our sales' problem would be very much simplified.

This, then, is the primary object of the Blue Star Home Plan. But a gas pipe stub in a room is in itself of no benefit, and the only way we can safeguard ourselves and clients is to get an approved appliance on this line. It is our problem to adapt this plan to our local conditions so as to meet our particular needs—to make a practical working plan of it and bring the utmost in results to each of us.

Realizing that the architect and builder of new homes is the man we must develop close contact with and interest in this movement, what is our first step?—what have we to offer them?—for naturally they are not going to be interested in anything which does not benefit them personally.

TO THE architect we can offer two distinct advantages. First, a national movement towards better built homes, for a Blue Star Home should mean more than just a well equipped gas home. It should mean a well built home also. As a matter of fact, we can not get much gas equipment in a home unless it is well built and of good construction, so we can well afford to stress construction without curtailing our program in the least, and secure the hearty co-operation of the architect and builder.

Second, we offer him standard pipe sizes and approved appliances which he may specify and recommend in the absolute assurance of satisfactory service without knowing more of them than that they bear the Blue Star. He can then buy appliances of a grade or price class commensurate with his construction plans.

From personal experience I know architects are very much interested in this idea, and have had a great many of them in various cities promise their hearty co-operation. In some cases they have called in their engineers and told them to specify Blue Star equipment in all future specifications.

To the builder we offer houses which sell more readily, that have a higher resale value, due to being of good construction, fully equipped for comfort, convenience and happiness, and so designated by the National Blue Star Certificate. We offer him sales helps in advertising, etc. in the sale of his house, and satisfaction to his clients. In fact, it is one co-operative movement in which everyone connected with it profits thereby.

It is now accepted as a truism by everyone that well established, responsible professions and industries cannot afford to give their customers, the public, anything less than the best service and that service continually. We all have our means invested in our business. The architect has his reputation at stake. This is equally true of the builder who has houses to sell. The gas company has extensive plants and an elaborate distribution system. The plumbing and heating contractors have their stocks on hand, their implements and their knowledge of the needs of those in the community. All hands are striving to build up a reputation for good service, courtesy and for that extremely valuable asset known as good-will.

IT IS to the interest of every single one of us to build homes correctly, to place in the homes of our people piping and appliances which will render safe, reliable and satisfactory service. The fewer complaints from the home, the better off we are at all times. This applies to all parties interested in the home, from the architect who plans the house to the gas company which finally sells the gas to the occupant.

This, then, is the Blue Star Home Plan and it offers the solution of all these problems if properly applied.

Now the question is, how is it to be applied?

What is a Blue Star Home?

A general definition is "A home of good standard construction, piped and equipped for maximum convenience and

(Continued on Page 66)

THE American Gas Association was well represented at the Pacific Coast Sales Conference, Los Angeles, February 23-24, jointly sponsored by the Pacific Coast Gas Association and the A. G. A. Kendall H. Flint, representing the Laboratory, brought the message appearing on the opposite page, and Capt. A. E. Higgins, who directs field work on the Blue Star plan for the national association, gave the paper which is published below.

Captain Higgins emphasizes throughout his paper the essential importance of converting the architect, builder and contractor to gas, through the Blue Star Plan, and he reviews the advantages which will accrue to everyone interested, when the Blue Star program is put into action. Last year saw encouraging beginnings, and during 1928 many additional Blue Star Homes will go into service as a result of this national sales plan.—*Editor.*

Medium Pressure Distribution *for* Low Consumer Saturation

By CHARLES W. ROBBINS

General Gas Superintendent, Oklahoma Northern Utilities Company
Ponca City, Oklahoma

IT IS the purpose of this paper to discuss the desirability of medium pressure for distributing gas in systems which are partially saturated with regard to the number of consumers connected. A fully saturated system is one in which one connection is made to the main for each lot in all the blocks covered by the existing lines. By medium pressure is meant distribution of gas at pressures between one and thirty pounds. It is also the purpose of this paper to outline one particular method for distributing gas using these pressures.

In recent years there has been a demand arising for a method of distributing gas at less cost per consumer in order that suburban districts might be served and that small towns situated near large pipe lines might be served economically. Usually these additions and small towns are pretty well spread out, making the installation of a low pressure system rather expensive. When a low pressure system is installed it is generally the practice to lay mains of sufficient size to take care of the consumption of the area served when the saturation has become complete. Following a plan of this sort, which is sound engineering practice, makes the cost of the initial investment run high and naturally makes certain prospective plants undesirable, since the connected sale could not pay sufficient returns on the necessary investment.

A system of gas distribution, using medium pressures, has several advantages over the low pressure distribution system. The chief advantage is the possibility of using smaller sizes of pipe, thus reducing the chief item of expense in a distribution system. This saving is offset when the cost of the service regulators and attendant installation and maintenance costs equals the saving effected by the use of smaller pipe. However, in installing a plant in an area only partially built up, only such regulators are installed as are needed for each particular consumer, and the pipe line is operated at very moderate pressures. As additional consumers are connected, more regulators will be needed and the operating pressures may be raised as necessity demands. These two characteristics of the system give it great flexibility, since outlying districts may be served to advantage with existing rate schedules, whereas a total loss would be experienced with a low pressure system, due to higher interest charges.

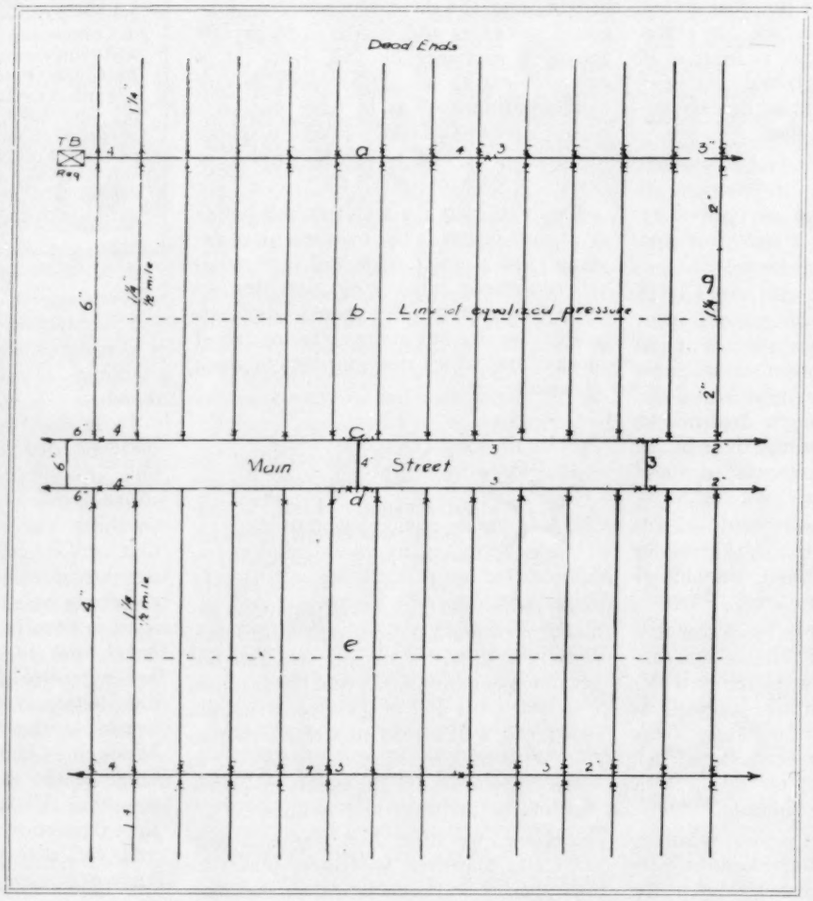

Figure 1.
Diagrammatic layout of medium pressure distribution system

The service rendered to a consumer should also be considered, inasmuch as each service has its individual regulator and there will be less fluctuation in pressure. This permits closer adjustment of the appliances with fewer complaints caused by changing pressures, as well as a greater average consumption due to high average pressure maintained. Where house heating is done there will be less interference to the system by large installations such as schools, office buildings, etc., since the pressure on the distributing mains is raised sufficiently to take care of the added demand and has no effect on the individual consumer. A low pressure system requires sufficiently large mains to take care of such local consumption or individual high pressure service, both of which are expensive.

The leakage in the medium pressure system must be closely watched inasmuch as the same number of leaks of the same size will cause more loss than in a low pressure system. However, leaks can be more easily located in high pressure mains. In the system as outlined below, the matter of locating leaks can be efficiently handled by means of lubricated stops placed in the laterals at the points of junction with the supplying feeders. This same system would not be so desirable at low pressures, due to increased cost and number of these valves. There are two additional ad-

vantages: there will be no leaking of water into mains, as the gas pressure will be higher than the hydrostatic pressure during rainy periods; and there will be no necessity to pump drips since these may be blown by gas pressure.

The one big disadvantage to the use of medium pressures is that of line loss. To counteract this, better methods of construction and maintenance must be used. However, the loss may be cut down quite materially, since it is possible to vary the pressure to suit the demand, thereby making it unnecessary to carry a steady pressure which would mean high loss. With modern methods of construction the matter of line loss can be successfully dealt with. Since this is the chief obstacle and can be dealt with, it should not be permitted to be the deciding factor.

CONSTRUCTION AND LAYOUT

The matter of construction and layout for the use of medium pressures is important. Figure 1 gives a diagrammatical layout of a medium pressure system when applied to a small town of the "Main Street" type. The sizes and lengths will give a general idea of the method employed. The object is to proportion the mains in sizes and lengths such that there will be an even pressure drop over the system with a minimum number of low spots. If possible, the number of low spots should be limited to one, and the pressure as carried at the town border varied to maintain a minimum pressure at this point. Without going into detail, the diagram was laid out on the following approximate assumption: Minimum pressure on the service regulators, one pound; pressure drop from feeder to low point on lateral, five pounds; pressure drop in east and west feeders, five pounds; pressure drops in north and south supply feeders, five pounds. This requires 16 pounds at the town border regulator with no allowance for the regulator to work on. A pressure of 20 pounds in this case would be advisable. Other pipe sizes and drop schedules could be utilized should it be desirable to use lower pressures at the town border, where manufactured gas is used, or should higher pressures be available from natural gas trunk lines. In the plat "A, C, D, and F" are the east and west feeders for supplying the small laterals run in the alleys. These feeders have been tapered in order to take advantage of the greater pressure drop allowances available and reduce the investment. The lateral running south from the town border is the main feeder for the system inasmuch as it supplies feeders on each side of Main Street and the feeder in the south part of the town. Should lower pressure allowances be required or should the consumption per consumer be higher, it would be necessary to taper the laterals starting with the 2 inch at both ends, decreasing to 1¼-inch or 1-inch in the center. The feeders on each side of Main Street have been tied together at two places in order to equalize the load, since the center of load will change during the day and also as the town grows.

COMPUTATION FORMULA

For computation purposes, Weymouth's formula has been used. Since the load is distributed and not concentrated on the end, the capacity of the line is greater than the formula indicates. If the load is distributed over 15 or more points it is safe to add 60 per cent to the indicated capacity. The formula is as follows:

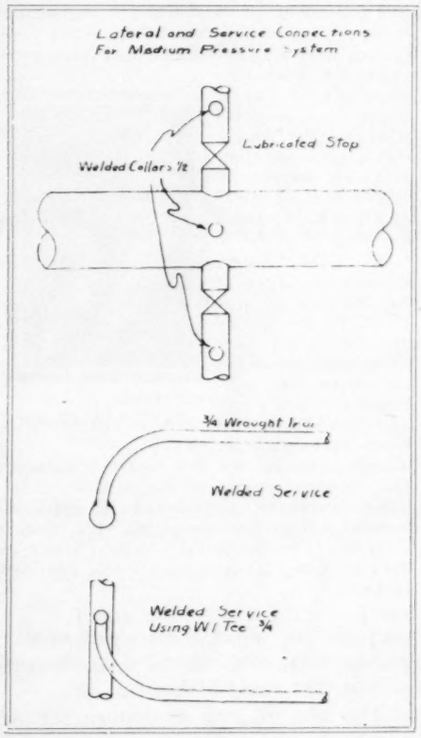

Figure 2.

$$Q = 37\left(\frac{(P_1^2 - P_2^2)\, d^{5\frac{1}{3}}}{L}\right)^{\frac{1}{2}}$$

Where:

Q=Cubic feet per hour.

P_1=Inlet pressure, pounds absolute (Gauge plus 14.4).

P_2=Outlet pressure, pounds absolute.

d=diameter main, actual, inches.

L=Length of main, miles.

Since the load is also a function of the length of main, assuming a certain spacing between consumers and unit demand for the purpose of designing the system, the load is indicated by the following equation:

$$Q = \frac{L \times 5280 \times D}{S}$$

Where:

D=Demand per consumer, cubic feet per hour.

S=Average spacing between consumers, with allowance for streets, etc., feet.

These two equations may be used together for determining the limits of the length or pressure drop when assumptions are made as to size, demand, length or allowable drop. The following equation will indicate the allowable length of the lateral when data are available for assumption as to spacing, maximum demand of consumers and the size of main.

$$L = \left(\frac{S^2\,(P_1^2 - P_2^2)\, d^{5\frac{1}{3}}}{20400 D^2}\right)^{\frac{1}{3}}$$

This length can be doubled if the lateral is fed from both ends. If the Weymouth formula is used without changing constant the length indicated will be quite conservative, as the additional capacity due to distributed load will aid in carrying the system over the occasional emergencies.

In general the computation should start, as in computing a low pressure system, with the consumer at the estimated low point, which is generally in the center of the lateral farthest from the supply. Possibly the most difficult figure to assume is the maximum hourly consumption per consumer. In the use of comparative data for estimates in unpiped areas or towns, due consideration must be given to the effect of rate, climate, and nationality, as well as the size of the residence, on the maximum consumption to be expected.

To facilitate the location of leaks, lubricated stops should be installed on all laterals where they tie into the feeders, as shown in Fig. 2, and also in the feeders themselves to permit isolation of sections for testing purposes, using the metering method. However, the pressure drop method could also be used. These stops are installed with Tees on each side, which permits installing a meter between the Tees and measuring the loss by shutting the stops at each end of the lateral and turning off the consumers. All gas going through the meter then supplies nothing but leaks. In this way the town can be rapidly surveyed for leaks, when the occasion suddenly or periodically arises, with a minimum expense. Lubricated stops are used since it has been found by test that these valves are the most reliable and leak the least. Of the several stops tested, one was found which had the

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Compensation *of* Salesmen *for* Rapid Load Building

By H. C. McALLISTER

Division Manager, Southern California Gas Company

THE rapid growth and expansion of the natural gas industry in Southern California in the last few years has kept the public utilities busy, extending their service to new territory, enlarging plants and re-enforcing distributing systems. Possibly we have failed to appreciate the potential market for gas sales on our old mains.

From now on, our slogan is "Increased Sales per Meter." We need more and better salesmen and must consider proper and adequate compensation. A change in policy should benefit the company as well as the salesmen, though of course in discussing one branch or department of our business we must not lose sight of the effect that radical changes would have on the morale of other departments.

One of the greatest problems in rapid load building is to maintain a spirit of enthusiasm, especially during the months that have been considered the low sales period. I know of no better way to arouse and maintain enthusiasm than to make it possible for salesmen to increase their earnings according to their willingness to work and ability to close sales. By far the best method of compensation under average conditions is a combination of salary and commission.

SUGGESTED PLAN

Assuming that salesmen are required to handle applications for main extensions and service, I suggest a salary of $100 per month plus:

5	per cent on sales of	$1,000
7½	per cent on sales of $1,000 to	$2,500
10	per cent on sales of over	$2,500

A special bonus or commission should be allowed in cases where other fuel-burning equipment is replaced.

Assuming that Mr. Average Salesman is now making monthly sales of $1,500.00 and is receiving a salary of $100.00 plus 5 per cent commission, or $175.00 per month,—his income would be increased $12.50 per month. Increase his sales to $2,500.00 and he receives $262.50 per month or an increased income of $87.50—Mr. Average Salesman will be a little more enthusiastic and has been given an added incentive to still further apply himself.

ONE of the three features which made up the "Symposium on the Industrial and Commercial Load," which occupied one entire session of the Pacific Coast Sales Conference held at Los Angeles on February 24 under the joint auspices of the Pacific Coast Gas Association and the American Gas Association was this subject of "Compensating Salesmen for Rapid Load Building."

H. C. McAllister

H. C. McAllister, division manager at San Bernardino, Calif., for the Southern California Gas Company, presented the discussion published on this page, and Geo. W. Smith, Santa Barbara, Calif., district manager for the Southern Counties Gas Company, spoke on the same topic.

Also numbered on the Industrial and Commercial Symposium program were discussions on "The Industrial Potential," and on "Selling Gas Equipment to Hotels and Restaurants."

The new business department should plan two or more special campaigns each year. Suppose we have a water heater sale this spring, everyone advertising and selling automatic water heaters. Put a little of the competitive spirit into the campaign by giving a prize or bonus to each of the three leading salesmen.

Possibly refrigeration is not thought of as a rapid load builder at the present time, but it should be considered. I believe these sales should be handled by a special salesman in each division or district, as gas refrigeration is comparitively new and there is considerable sales resistance to be overcome. A trained man on a straight salary will build this load quicker and better than the average appliance salesman.

Assuming that sales the first year are materially increased or show satisfactory progress, it should then be possible to increase the salary of these salesmen enough to keep them interested. At the end of the second year refrigeration with gas should be fairly well established and we could then adopt the salary plus commission plan.

SELLING CENTRAL HEATING

The sale of central heating plants is possibly handled well in the larger cities, but is not being properly looked after in the smaller cities and towns. A capable man, on a straight salary, should be assigned to this work in each division or district, as there is work to be done with the architect and builders, and the heating load should be materially increased each year.

The sale of gas for industrial purposes is certainly a quick load builder and is the life saver of the gas company. Competent engineers on a straight salary should sell industrial gas.

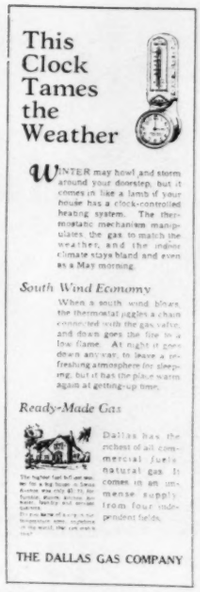
Men selling heating, refrigeration and industrials should be more than just salesmen. They should be Ambassadors of the Company. In other words, they should be able to plan and execute campaigns to surmount obstacles retarding the progress of the company in their fields. Their chief mission should be that of a purveyer of professional service and co-operation, thus creating confidence and good will. Work of this kind takes time and will not be accomplished if the necessity of immediate commissions divert their attention from the broader and more comprehensive problems.

SPECIAL COMPENSATION

Special payment or reward to other members of your organization outside of the regular sales force should be arranged.

Some form of prospect ticket should get a wide distribution throughout all departments, other than sales. Where a sale is made from one of these outside department leads, the employee turning in the ticket should be given a bonus of whatever amount the schedule may call for.

There is no limit to sales possibilities and all departments can help build the load.



A "Wrinkle" *for the* Advertising Department

Mat Services Can Aid *in* Dressing Up *the* Gas Company's Messages

By LOIS UPSHAW
Advertising Manager
The Dallas Gas Company
Dallas, Texas

THE advertisements above are samples of Miss Upshaw's productions for the Dallas Gas Company, wherein is evident the effective use made of "canned" illustrations she has judiciously chosen from newspaper mat service. It is the author's contention (and we agree) that the "ubiquitous" mat will often do the job of a high-priced original —and do it just as well.—*Editor.*

BIG, rich companies with real art departments will not be interested in this piece. They will be too proud to use newspaper mats for their illustrations. As for us, we cheerfully admit that some of our most satisfactory advertisements are those we build around drawings from that ubiquitous reinforcement, the newspaper mat service. And we believe that there are plenty of our contemporaries who would enjoy these free drawings if they knew more about them.

Some mat services are tacky, of course. And even in the good ones, you may find only three or four things a month that are suitable to your advertising. But at least one newspaper in a town will carry a high class mat service, and you can save up the usable mats as you spot them, and run them months afterward. In Dallas we have access to seven services. There is one fashion service that supplies excellent drawings of children, and we get almost nothing else from it. Another service does its best work in skylines and dwellings. We depend on still another for good looking interiors and little "spots" (tiny landscapes, men playing golf, a ship, or a cooky jar, that you can use with initials, or as tail pieces.)

SMART ADVERTISING HAS ITS PLACE

I realize that we use more general illustrations than many gas companies do, because we do not sell appliances. We do advertise gas equipment, of course, almost to the half of our space, but we call no names and use no factory cuts. If you sell appliances, then you have a mat service from the factory you represent, and no doubt most of your space goes for merchandise copy. But even so, you can often brighten up a stove advertisement and give it an air, by introducing a drawing that does not look too stove-ish. We can be specific, and bear down on brass tacks all we please, but there is a definite use for sophisticated advertising in gas company copy now and then . . . with a certain smart and spacious atmosphere sometimes known as "class appeal."

Since we spend good money for print in the papers, we might as well work to get it read. And the only way to do it is to make it attractive to the eye, and interesting in content. It needs to be varied (this high-priced print) both in style of layout and in content. New topics ought to bob up now and then, with illustrations that do not in the least remind you of a gas company. The worst thing that could ever be said about any public utility advertising is that it *looks* like utility advertising. Therefore we put as much work on the layout as on the copy writing; often more. The best copy on earth is money thrown away if it does not carry the desired effect. A well set and attractive looking advertisement will make a good impression on many people who do not read it. Their eye will catch the general drift, they will see that it is the Gas Company talking, and will pass on, but they liked it anyway. This is worth something. By the same token, a dull looking piece of advertising, while it staves off practically all readers, stamps its dullness on them as they pass it by.

In the meantime, all advertising does not need illustration. (The engravers' Chinese slogan to the contrary notwithstanding.) For the sake of variety alone, it pays to run a plain black-and-white occasionally. And, like a well tailored costume, the unadorned type can have fine lines and a finish that make it stand out in a crowd. It requires as much care and work to make a good plain layout, as one with pictures.

COMPETING FOR ATTENTION

In making illustrated newspaper layouts, we cast about for ways and means to compete with the high-priced drawings spread around by the hosiery, tobacco and automobile trades. Sometimes you make your own drawing, but if the

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Public Relations Can be More than *a* Generality

By H. L. ZIEGELMEYER
District Agent, Southern California Gas Company

TO THE seasoned convention-goer this paper by Mr. Ziegelmeyer comes as a welcome relief. It takes the threadbare topic of public relations out of the abstract, to which field it is too often confined, and brings it down to cases—concrete examples of what one company is doing at the never-ended task of building and retaining consumer good will.

This discussion was given before the public relations section of the Pacific Coast Gas Association at that body's regional conference in Los Angeles, February 23. It was offered under the title, "Training the Employees for Better Public Relations," to which phase the earlier paragraphs are devoted. Space limitations forbid giving the paper in full, but the following excerpts will be of definite interest.—*Editor.*

TRAINING an employee for better public relations implies two things—first, that the employee by schooling and experience becomes competent to render service to a customer or to the public either by act or by cound advice and information relative to a public utility activity; secondly, that the employee be given an opportunity to do so. Training of employees should be classified under two heads, general and individual, or departmental.

Under the head of general training the Southern California Gas Company has a monthly meeting of department heads to which various employees from all departments are invited and which invariably places some emphasis on public relations. In this way the attitude of the management and their desire for friendly and cordial relations is passed on to all employees.

COMPANY MAGAZINE AIDS IN WORK

The entire attitude of the company in its business dealings is reflected in the monthly magazine or house organ sent to all employees. Not only is the value of good public relations stressed directly in this magazine but every article has some indirect bearing on the integrity, fair mindedness, and desire to give service which lies behind the management.

In order to train our men for more careful and safe work, a safety supervisor holds meetings in the various divisions and gives instructions so that these men will not only carry on and work with the minimum amount of danger to themselves and the property of our customers, but so that they will be able to give first aid treatment should the emergency arise.

One of the indirect ways our company trains its employees so that they may improve our public relations is by the attitude of the management toward the employees themselves. By group insurance and the liberal provisions of an insurance and pension plan, the employees learn of the consideration which is being given them by the company. In this way they will have a standard of action against which they may check their own dealings with the public.

Public speaking has been adopted as an effective means of employees education, and several classes have been formed which were very well attended by employees of almost every branch of our business. Many vocational and reactional activities have been encouraged and recommended. Notifications of special courses of night study are regularly bulletined, while sports are made popular through competitive teams in bowling, golfing, baseball, etc.

Our company subscribes to numerous publications dealing with problems of the gas business, most of which deal extensively with the subject of public relations. These are circulated among employees in the various departments for reading and comment.

Individual training of employees who meet the public in the Customers' Department is accomplished by instruction by various department heads. As a new employee is brought to a station where he will meet customers he is given definite instruction in regard to the policies of the company as they relate to courteous and considerate handling of each person's affairs.

Considerable time has been devoted to the training of counter clerks and adjusters, endeavoring to impress them with the necessity of being polite, courteous and tolerant toward all customers, always using a pleasant tone of voice even under the most trying circumstances, and remembering that discourtesy is not only shown through a direct insult—it can as readily be defined as inattention, indifference or lack of interest in the customer's problem. Any customer whom counter clerks or adjusters fail to please must be referred to a supervisor and not allowed to go away dissatisfied.

Another plan we have adopted is to have Customers' Department employees who contact the public make periodical trips to meter shops and other branches of the Operating Department to give them an education into the workings of these various departments so that they may more capably discuss the customer's problem with him.

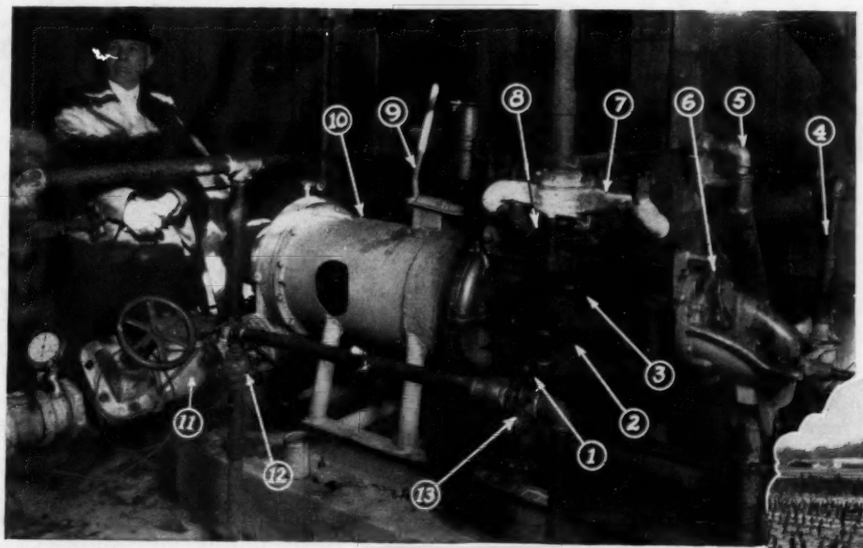
Special training is given to Records and Information Clerks of the Customers' Accounting division, who, although they do not actually contact the customer, furnish information to application clerks, adjusters, payment clerks, collection clerks, etc., being virtually the eyes of these employees whom they supply with information. By making specialists of these employees we increase our efficiency in the taking of applications and the making of adjustments, saving time for and giving maximum satisfaction to the customer.

Close observance is made of the handling of customers by employees over the telephone, noting their promptness in answering calls and their disposition toward customers while talking. Exchange operators are required to observe and report any laxity on the part of telephone order clerks, especially in regard to promptness. All complaints registered with these operators are carefully investigated and replies made to the complaining customer.

Telephone engineers and supervisors have been called to review the telephone situation and study our working conditions for the purpose of instructing telephone operators and order clerks in the proper operation of equipment, making necessary changes for the facilitation of the work.

Meter readers and collectors, aside from being trained to perform their several duties, receive special training and instruction through periodical meetings presided over by the Chief Collector and Chief Meter Reader. These meetings are a discussion of problems and review of rules, especially for the benefit of new arrivals. A very recent idea put into practice was the training

(Continued on Page 50)



LEFT: Details of this Fordson tractor installation, which operates on natural gas fuel, and pumps water to irrigate a large Texas nursery, are given in Mr. Martin's article on this page.

BELOW: A portion of the Texas Nursery Company's propagation acreage planted to young cedars, showing office buildings and gas heated hot houses in the distance.

How Natural Gas Aids One Texas Nurseryman

By J. WOODWARD MARTIN
Chief Engineer, Municipal Gas Co., Dallas, Texas

WITH the rapid growth of the Empire of the Southwest—Texas—all phases of modern life and industry are constantly undergoing changes in order to keep up with the tremendous pace of progress and development. The Nursery business is no exception.

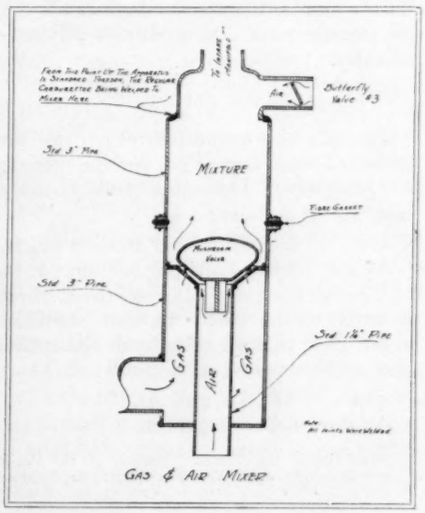
The Texas Nursery Company, through the able management and guidance of Mr. C. C. Mayhew, president and active manager, has forged ahead to its present position as one of the largest nurseries in the Southwest, due to a constant study and adaptation of new processes and modern devices.

A trip through the Texas Nursery Company's plant at Sherman, Texas, their headquarters, reveals to the visitor the great scope this company has undertaken in its particular field. In the propagation department between seventy-five and one hundred acres are available for the propagation of many varieties of shrubs and plants. While at present only seven acres are under irrigation, the writer was told that this number of irrigated acres of propagation beds will be increased to fifty within the next two or three years.

After much study and comparison of cost data, natural gas employed in an internal combustion engine, a Fordson Tractor, was decided upon as the most ideal power for pumping water to be used for irrigating purposes, and it is on this power that the increase in irrigated propagation acreage is to be made.

One of the views above shows a part of the company's southeast acreage. In the immediate foreground is a bed of young cedars and, in the background, is shown the stone office building, warehouses, and some of the hot houses.

In the hot houses of this company, natural gas has long been employed as the most economical and satisfactory means of maintaining constantly the temperature desired in each house. These temperatures vary in the different hot houses, but all are controlled from one central heating plant in which natural gas is the fuel.



GAS & AIR MIXER

The larger view above shows the Fordson Tractor to which the centrifugal pump is direct-connected, and which unit supplies the irrigating water. This pump operates, under normal conditions, at a suction head of about 12 feet on the intake of the pump and at a discharge head of 35 pounds. The water is pumped from a surface pond, on the banks of which is located this pumping unit, to the highest point on the Texas Nursery Company's property, where it is then piped to the propagation beds. Spray irrigation is used on some of these beds, and channel irrigation on others. However, the spray irrigation is the method from which this company is receiving best results and is the one that they will employ most generally, as the growth of irrigation progresses. In the conversion of a Fordson Tractor to this service, T. J. Roberts, shown in the background of the illustration above, has employed some very ingenious engineering principles.

As you will note in this picture, a Fordson Tractor engine was taken out of the frame and mounted on two I-beams which had been previously set on a concrete slab. A piece of 16-inch pipe was employed to connect the centrifugal pump direct to the engine, by

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Introducing Oil *Into* Distribution Lines *to* Reduce Leakage

By GUY CORFIELD
*Los Angeles Gas and Electric Corporation**

NATURAL gas as it issues from the wells is saturated with water vapor and also contains, per 1000 cubic feet, from one to four gallons of natural gasoline. This gasoline is removed in the field at the absorption plants, where the gas is scrubbed with absorption oil under high pressure, ranging from 100 to 500 pounds. The gas is then discharged into the transmission mains at this same high pressure, saturated with absorption oil and water vapor.

A consideration of partial pressure laws of water and other easily condensable vapors in gas, assuming temperature to remain constant, will reveal that as the pressure drops—or the gas expands—gas becomes undersaturated with these vapors in proportion to its change in absolute pressure. For instance, a gas originally saturated at 85 pounds gauge pressure would be only 30 per cent saturated at 15 pounds, or 15 per cent saturated at the consumer's meter.

EFFECT OF DISTRIBUTION SYSTEM

As a result of this dryness or unsaturated condition of the natural gas, it was feared that when this gas was introduced into the distribution system of Los Angeles the deposits in the mains, consisting probably of tar, napthalene, light oils and gums, would be gradually dissolved and removed, resulting in a loosening of rust and scale particles to be carried in the gas stream. It was also suspected that gaskets, packing and meter washers and diaphragms would harden and shrink, causing leakage and fast meters.

It soon became evident that the leakage and dust were increasing and, faced with the increased volume and higher velocities of the winter months, it was decided to inject into the gas something to reduce, as much as possible, this unsaturated or so-called "dry" condition. The obvious place for treatment was the discharge headers at the Ducommun Street compressor station, through which all the gas passes before discharge into the distribution system. Of course the gas is at its highest pressure at the discharge of the compressor station, varying from four to 60 pounds, and even if saturated with volatile matter its subsequent expansion throughout the system again creates the condition of undersaturation. Nevertheless considerable volatile can be introduced at this point. On the first of August, 1927, the treatment was begun by injecting steam into the gas in excess of that absorbed, the excess condensed water being drawn off from the bottom of the headers. An average absorption of 70 gallons per million standard cubic feet of gas was obtained, which resulted in an average of 65 per cent water vapor saturation of the gas at the consumer's meter as against as low as 10 per cent saturation before treatment. Later it was decided to inject a light oil into the gas, the oil chosen being a Standard Oil product designated as Calol Gas Oil No. 2, having the following specifications:

OIL SPECIFICATIONS

Gravity 35 deg. Be. at 60° F.
Flash 225° F.
Fire 240° F.
Initial boiling point 440° F.
End point 576° F.

Starting November first, 1927, this oil was injected into the gas in the same discharge headers by means of steam and a modified Kellett oil injector. A constant pressure of 100 pounds is carried on the steam and 70 on the oil, the latter being injected at the rate of 10 gallons per hour at each of three locations. This injects an excess of oil and steam over that picked up by the gas, the excess being drawn off at the bottom of the headers and pumped back to oil storage. The water settles to the bottom of the oil storage tank and is drawn off periodically.

AVERAGE ABSORPTION

Average absorption figures per million standard cubic feet of gas for the months of November, December and January last, are as follows:

Oil 3.4 gallons per million cu. ft.
Water 29.6 gallons per million cu. ft.

The gas treated during these three months totals 4,816 million standard cubic feet, making the total absorption during this period as follows:

Oil 15,212 gallons.
Water 102,392 gallons.

Laboratory tests under atmospheric conditions indicate that the dry natural gas, previously saturated with water, will absorb six gallons of oil per million standard cubic feet, which checks very well against the 3.4 gallons now absorbed under pressure. Possibly more oil could be introduced by installing drip feeds, similar to sight feed lubricators, at strategic points throughout the distribution system. Similar tests also indicate that dry natural gas, untreated with water, will absorb 15 gallons of oil per million standard cubic feet, so that if oil, rather than water, is found desirable, it might be interesting to try injecting the oil with high pressure gas instead of steam. This greatly increased absorption of 15 gallons with untreated gas as against six with "water saturated" gas is hard to explain from theory of vapor tension and partial pressure, but it nevertheless seems to be a fact that water vapor greatly retards oil absorption. On the other hand, the converse of this should hold true, and it would seem that the presence of water vapor in the gas would retard absorption of volatile matter from the gaskets, packing and pipe walls, and therefore be very beneficial.

LITTLE CONDENSATE ENCOUNTERED

It is too early yet to draw any definite conclusions, as the changes for better or worse are slow and hard to observe. There can be no doubt that the addition of volatile to the gas lessens its absorbing power. Only very small quantities of the water or oil, as condensate, have been found in the mains, and these close to the gas works and along a direct transmission line. This shows that the gas is not saturated, nor carrying liquid mechanically for any distance. Should injection be augmented up to the point of saturation and condensation the water might corrode the pipes and the oil destroy rubber diaphragms and gaskets. It is doubtful if such corrosion or destruction can take place to any extent if only the vapor phase is present. The most satisfactory amounts of water, or oil, or both, to be introduced into the system, have not yet been determined, but it seems possible that an amount sufficient to bring the gas up to a point just below saturation, at average main temperature, will give the best results. Perhaps some volatile solid, such as napthalene, dissolved in the oil, will help to fix the dust.

*Read before the Technical Section of the Pacific Coast Gas Association, February 24, at the Southern Regional Conference. Sessions were in Los Angeles.

Devising *a* Good Housekeeping Plan *for* Utility Properties

By H. ELLIOTT TAYLOR

A "GOOD HOUSEKEEPING" plan, whereby the Pacific Gas and Electric Company has enlisted, in a spirit of friendly competition, the co-operation and interest of all of its employees in setting and maintaining high standards in the upkeep of company properties in three major departments, i. e., the General Offices, Gas Department and Electric Department, has recently been inaugurated.

The plan as it operates is substantially as follows:

Its general control and administration is vested in a general rating committee operating under one of the vice-presidents of the company. In the gas department, the committee is under W. S. Yard, vice-president in charge of gas construction and operation. The committee on office buildings is under R. E. Fisher, vice-president in charge of public relations and sales.

Rating of gas properties is accomplished by dividing the territory of the company into three territorial sections, each section being composed of five divisions. In each section a sectional committee is appointed, its membership consisting of one employee from each division in the section. These committeemen visit the gas properties within their respective territories and determine the ratings of these properties according to a set rating schedule supplied to them.

This Chico holder station was premium winner for P. G. and E. Northern Division

The rating schedule of all properties is determined by assigning to the various component subdivisions of each property a certain maximum number of points of merit from which deductions are to be made as the lack of care and attention to property appearance may appear to warrant. The age, obsolescence, or relative importance or capacity of the property or equipment are not considered as factors in establishing ratings, emphasis being placed upon such conditions as are under the control and dependent upon the interest and efforts of the employees in its upkeep.

Three classes of properties for which awards are made are: gas meter repair shops; holder stations and gas production plants.

The sectional committees visit and rate upon the printed schedule the various properties within their territories, and submit an annual report setting forth the rating as arrived at, which annual reports then go to the general committee in care of the vice-president in charge of gas construction and operation.

After receiving these reports the general rating committee inspects the plants that rate highest in each section. Then taking into consideration the entire system, this committee awards first, second, and third prizes to each of the classes of properties, and in addition awards a premium to that property in each territorial section which receives the highest rating of all properties, regardless of class.

In following the plan of awards on the office ratings, certain modifications are noted, but the system is substantially the same. Offices are rated by a committee composed of three employees in each division who inspect and rate all of the offices within their own division. Copies of the divisional committees' reports are forwarded to the vice-president in charge of public relations and sales. Another general rating committee then takes over these reports and from those standing highest on the list makes its inspections and final awards. First, second, and third prizes are then given to those offices standing highest in their own class of office, i. e., division, district and agency. The office receiving the highest rating of all offices in all classes is accorded a special recognition.

There has been a marked acceleration of interest in maintaining a higher standard of cleanliness and orderliness in both offices and gas properties since this system has gone into vogue, although it has been in operation but a short time, and the first list of awards for excellence has just been published.

Gas property awards, as announced in January, are: First in production plants, San Rafael; holder stations, Santa Rosa; meter and regulator shops (Class "A") San Rafael, (Class "B") Santa Rosa. The premium property, selected regardless of class was, in the Northern Section, Chico holder station; Central Section, San Rafael gas plant; and Southern Section, Oakland 50th Avenue holder station. Office winners were as follows: Firsts—Division offices, Fresno; District offices, Woodland; Agency offices, Newman. Newman in addition to winning the first prize as an agency office, wins the award as the premier office of the company system.

The tokens of recognition have been selected and will be distributed within a few days. Prize winning properties in the gas department are given a special framed certificate, to be placed on the wall somewhere in the plant or shop. Prize winning offices will receive a spe-

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WHAT house-to-house appliance adjusters found in Los Angeles homes they would in all likelihood find in any other American city: *Obsolete* appliances—water heaters and space heaters of *inadequate capacity*—Range ovens *out of service* for years at a time—*and the gas company shoulders the blame.*

Inferior Appliances Limit *the* Load

—and *a* house survey will prove it *to* any company's satisfaction

By A. R. BAILEY AND W. E. BRANDT

*Los Angeles Gas and Electric Corporation**

IN APRIL, 1927, the Los Angeles Gas and Electric Corporation inaugurated a house-to-house adjustment of gas appliances. The primary object of this appliance adjustment survey was to put the consumer's appliances in shape to satisfactorily burn the 1100 B.t.u. natural gas which is now being supplied in place of the former 850 B.t.u. gas.

Since the institution of this house-to-house appliance survey, we believe that the undertaking probably would have been justified even though there had been no change made in the gas.

Many of our consumers were found to have an unsatisfactory condition on their premises which they have come to accept as a matter of course, thinking that there was no remedy. The cause of these unsatisfactory conditions has, in some cases, been due to part of the company's equipment, but as a general rule, it is the consumer's appliance that is the trouble maker.

CAUSES OF IMPROPER OPERATION

These appliance difficulties are the result of various conditions such as improper construction, inferior material, inadequate capacity and obsolescence. Some of the cases must have existed prior to the time of our supplying straight natural gas, and yet the consumer had accepted the condition as unavoidable. This poor functioning of equipment has in many cases not only restricted the gas consumption but has prejudiced the consumer against the use of gas appliances.

In noting the condition of the consumers' equipment, it is surprising to see the number of old and worn out appliances in use. This is particularly true of ranges, which, due to more frequent usage, show greater depreciation. Even in many of the larger residences we find appliances that should have been discarded several years ago. Here, obsolescence has caused the consumer to avoid their use whenever possible.

Improper construction or improper assembling of new appliances causes its share of difficulties. This is more noticeable in ovens than any other place. Oven linings which partially obstruct the vent outlet and oven bottoms which restrict the admission of air for combustion are found every day. These conditions cause oven explosions, which tend to make the victim fearful of all gas appliances and give others the impression that our commodity is not safe. Second hand ranges are sometimes sold to people of moderate means and it is often the case that these ranges have been reconditioned by individuals quite ignorant of the principles of oven construction. Smothering ovens are all too frequent on these second hand and reconditioned ranges and the tendency to blame the imperfect operation to "poor gas" is ever present.

Solid tops which have been placed on grid tip ranges also lead the consumer to believe the quality of the gas to be poor. The fumes produced cause more or less discomfort and in his ignorance the consumer thinks the trouble is with the gas and not the appliance.

There are three classes of appliances which are frequently operated over their capacity due to the fact that they are entirely too small to produce the results expected. These are space heaters, water heaters and steam boilers.

SPACE HEATERS

When people purchase space heaters, they seldom consider their capacity. Low cost is their first consideration, beauty of design the second and little or no thought is given to the ability to heat the space desired. If the person is not properly advised by the salesman, the result is usually a heater which is too small to give the desired heat. To offiset this lack of capacity, the gas is turned too high and poor combustion is the result. If the room ventilation is poor, this imperfect combustion may result very seriously for the occupants and the reputation of gas appliances in general suffers from the unfavorable publicity.

Even where the space heaters are built in at the time of building construction, they are frequently too small. Cases of recent installation have been found where the heaters were entirely inadequate. The dealer tells the consumer that the lack of heat is due to poor gas pressure and when the gas company's man affirms that the heaters lack capacity, the consumers do not know whom to believe. They do know, however, that they are not getting proper results and thir minds often turn to other kinds of appliances and other fuels.

WATER HEATERS

Water heaters, especially storage heaters, are frequently of insufficient size. Where there are several members of a family using the water, the supply of hot water is quickly exhausted and the people must either wait or get along without their water being as warm as desired. Here, a heater of the proper size would not only keep the users in better humor but would also increase the gas consumed.

Steam boilers, particularly in apartment houses, are often too small for the amount of radiation. This may escape notice for a season or two if the weather is moderate. Then, with a cold spell which brings temperatures below ordinary winter temperatures, the boilers are unable to care for the added temperature rise necessary. This is a very inopportune time for the failure to occur as the consumer is not only in a disagreeable state of mind on account of his discomfort, but he readily attributes the trouble to a poor supply of gas caused by the cold weather. Where the appliance has given satisfaction during a previous mild season, it is very difficult to make him believe the installation is too small.

These and other appliance troubles

(Continued on Page 52)

* Read at the Thursday afternoon general session of the Pacific Coast Gas Association's Southern Regional Conference, Los Angeles, February 23, 24 and 25.

Gas Installation *for* H. R. T. Boilers

By GEORGE BOWERSOX
Southern California Gas Company

BEFORE we discuss the use of gas and gas burning equipment in return tubular boilers, there is one erroneous impression that should be corrected. It is a common statement by many engineers that "they can make as good gas burners as anybody." This may be true in exceptional instances, but in the majority of cases it is wrong.

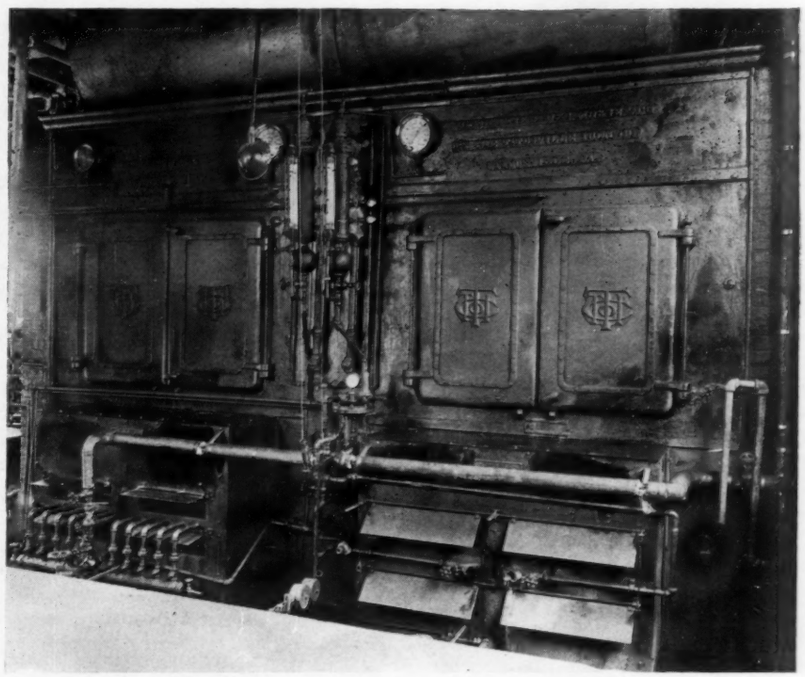
It is no more difficult to design an electric motor than a gas burner. Both pieces of equipment must incorporate a few fundamental principles if they are to perform their job satisfactorily. Very few men would attempt to build an electric motor, but anyone will try to make a gas burner. The ordinary difficulty with home-made gas burners is their inability to perform economically on a variable load. Such burners are usually capable of carrying the peak load because that is the important load from an operation standpoint. But no study is required to show that this peak is of short duration, so during long hours the boiler is not being operated economically, either due to the admission of excess air or excess gas. That is enough evidence in behalf of a properly designed gas burner.

George Bowersox

To have a good gas installation in a return tubular boiler, the following conditions should exist:

1. Even distribution of heat,
2. No flame impingement on either the refractories or the shell,
3. No requirement for target or checker wall,
4. Sufficient combustion space,
5. Low furnace velocity.

Following the outline above: to obtain even heat distribution, the gas supply must be admitted through several high pressure gas burners, or one or two multi-tube burners of the common low pressure type. To properly distribute the heat the flame must be short so as to utilize the front end of the shell. Dead spots or areas should be eliminated in the combustion chamber.



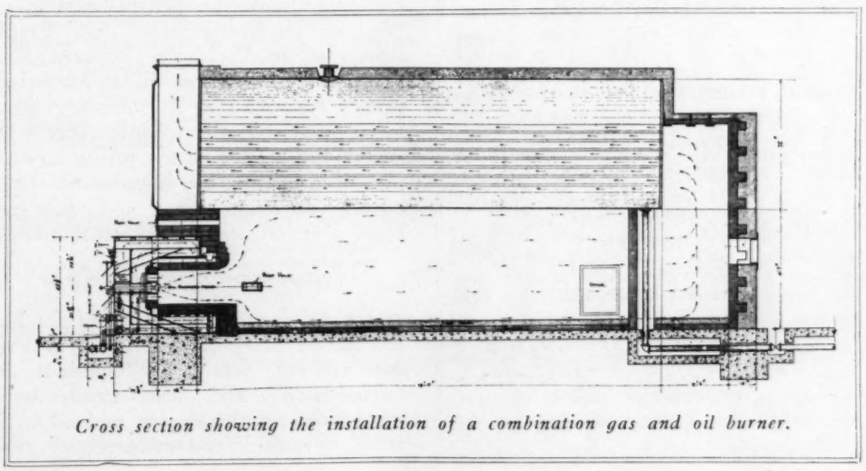
Two 80-H.P. return tubular boilers equipped with low pressure gas burners and auxiliary oil burners.

To have the gas flame impinge against the deck or walls is a common fault due to the location of high pressure burners. The flame should just lick the floor to raise the floor to a radiant temperature. This will naturally bring the side wall up to the same condition. Then the boiler shell is working evenly and the radiant heat from the floor and walls accelerates the combustion of the gases.

The use of a target or checker wall is a practical remedy to improve the operation of a poorly designed burner or to correct for the use of excessive gas pressure. The bad effect of a target results from the localized reflected heat which will rapidly deteriorate or bag the shell at that point. A checker wall reduces the combustion space as it tends to direct the gas against the cool surfaces of the boiler, and if combustion has not been completed the gases will be cooled below their ignition point and unburned gas, an expensive product, will pass up the stack.

The question of the size of the firebox has been settled by competent engineers, and for the ordinary gas burner installations there should be two to three cubic feet per boiler horse power. The practical limits of the load that can be carried by a boiler are determined by the available space in which to burn the gas, and the draft obtainable. Many

(Continued on Page 53)



Cross section showing the installation of a combination gas and oil burner.

PACIFIC COAST GAS ASSOCIATION

447 Sutter Street, San Francisco, California

A Department Conducted by Clifford Johnstone, Executive Secretary

The Coast Sales Conference

(Continued from Page 19)

vice-president of the Los Angeles Gas and Electric Corporation, expressed that company's pleasure in offering its splendid building facilities for the use of the meetings.

C. O. G. Miller, president of the Pacific Lighting Corporation, and a foremost leader in western utility circles, was next introduced. Mr. Miller's remarks were directly in line with the sales theme of the conference. He expressed his conviction that sales effort is the present vital need of the gas industry, and gave it as his belief that successful selling calls for three chief requisites: a confidence in the company for which a representative is selling; an equal confidence in the produce being sold; and complete sincerity in representations made while selling.

"The Industrial Potential" was appropriately designated as title for a discussion of the industrial load, led by C. M. Grow, manager of new business, Southern California Gas Company; F. H. Bivens, general agent, Southern Counties Gas Company; and J. H. Gumz, industrial engineer, Pacific Gas and Electric Company. Another program detail of interest to industrial gas men was the inspection trip Saturday morning, arranged through the courtesy of the three companies serving Los Angeles and adjacent territory. A profusely illustrated booklet on Modern Industrial Gas Furnaces as "Industrial Potential" was prepared and distributed at the industrial sessions by the same three utilities.

Four plants were visited on this inspection trip, those of the Hughes Tool Company, Plumb Tool Company, Angeles Steel Company, and the Southern California Gas Company's furnace construction department. Heat treating and forge furnaces were the center of interest on the trip.

F. U. Naylor, manager of gas sales for the Pacific Gas and Electric Company, led a discussion on "Selling Gas Equipment to Hotels and Restaurants," and this was followed by two contributions under the head "Compensation of Salesmen for Rapid Load Building," made by H. C. McAllister, division manager for the Southern California Gas Company, whose paper appears in this issue; and by George W. Smith, division manager for the Southern Counties Gas Company. This discussion wound up the individual and commercial symposium.

The "Symposium on the Domestic Load," for which the conference re-convened Friday afternoon, was shared in by a number of gas sales executives, from the West and from eastern points as well.

Representing the American Gas Association were K. H. Flint, Appliance Laboratory inspector, located on the Coast for several months past; and Capt. A. E. Higgins, Blue Star representative from A. G. A. headquarters. Their papers, on two different phases of the Blue Star program, are included in this issue.

J. E. DAVIES SPEAKS

J. E. Davies, general manager of the People's Gas Stores, which organization is the merchandising arm of the Peoples Gas Light and Coke Company, Chicago, brought out a whole barrage of possibilities for the gas merchandiser seeking live suggestions for his department. Mr. Davies displayed a selection of his "department store" advertising, told of his "one for 40 cents, two for 39" gas toaster campaign which is selling 100,000 toasters in Chicago, and all in all made it clear that the brand of selling of which he is an advocate is well styled "Merchandising with a Punch"—by which topic the program heralded Mr. Davies' remarks.

All of the extended program on the domestic load was excellent. Isobel Allobach, home service director, Southern Counties Gas Company, discussed "Color in the Kitchen." Three men were scheduled to take part in the "Successful Campaigns" feature, which told of how selling has been put over in smaller company divisions. Those taking part were: J. S. C. Ross, division sales manager, Pacific Gas and Electric Company; and M. W. Gahan, division manager, Coast Counties Gas & Electric Company. W. S. Dicken, division sales manager, Puget Sound Power & Light Company, was unable to be present to read his paper, which, together with those by Messrs. Ross and Gahan, appears in this number of *Western Gas*.

Clyde H. Potter, vice-chairman of the P. C. G. A. Commercial Section (presiding at the Friday afternoon and evening sessions of the Sales Conference, in the absence of C. R. Miller, chairman of the Commercial Section), and general commercial agent for the Southern Counties Gas Company, outlined the 1928 merchandising program of his utility in considerable detail, under the head "Planning the Campaign." H. M. Crawford, sales manager, Pacific Gas and Electric Company, was down to share in this discussion, but passed up the opportunity due to the lateness of the hour.

J. C. Douglas, National Refrigeration Company, spoke on general aspects of "Selling Gas Refrigeration", and Frank Packer of the Welsbach Company gave some sound views on "The Manufacturer's Responsibility", expressing it as his opinion that the manufacturer who expects the dealer or the utility to supply all the initiative in sales has only himself to blame when appliances remain over-long in factory stock rooms.

COMPETITION SYMPOSIUM

The third and final session of the Pacific Coast Sales Conference, held Friday evening, was a "Symposium on Competition", and dealt chiefly with competition of the electric and oil varieties. Frank Weiss, manager of new

ASSOCIATION CALENDAR

JOINT MEETING WITH ARIZONA UTILITIES ASSOCIATION
Prescott, Arizona
April 26 and 27, 1928

NORTHERN REGIONAL CONFERENCE
Vancouver, B. C.
June 6 and 7, 1928

35TH ANNUAL CONVENTION
Hotel Coronado, Coronado, Calif.
September 17-20, 1928

business, Los Angeles Gas and Electric Corporation, lifted several leaves from the book of the electric utility industry for the benefit of the assembled gas men. The burden of his remarks was that the electric industry has organized for aggressive selling, and he pointed the moral that the gas man must organize to balance up this lopsided situation. F. U. Naylor, manager of gas sales for the Pacific Gas and Electric Company, also contributed to this discussion, which was programmed under the head "What Can We Learn from Our Competitors?"

"Meeting Electric Competition", the next discussion head, continued the theme begun by Mr. Weiss, with George W. Smith, division manager, Southern Counties Gas Company; F. M. Banks, Southern California Gas Company; and J. C. Douglas, National Refrigerating Company, taking part. Mr. Douglas greatly enlightened those present by giving a typical "canvass" as put on by the electric range salesman.

Charles Robert, industrial engineer for the Los Angeles Gas and Electric Corporation, in his discussion under the head of "Meeting Oil Competition", brought evidence to prove the fallacy of selling gas in competition to oil on a straight cost basis. Said Mr. Robert, the proper course is to so thoroughly demonstrate the cleanliness, flexibility and general superiority of gas for industry and for domestic heating that the prospect would refuse oil if it were entirely gratis. Meanwhile, through making one B. t. u. do the work of two, the industrial gas man can more than hold his own in the industrial and house heating field.

This review of the Southern Regional Conference would be incomplete if it did not give some detail on the Sectional meetings which opened the conference Thursday morning, and which, in the case of the Technical Section, were resumed on Friday morning. Incidentally, there were 100-odd present at the Friday morning meeting of the technical men.

The work of the Public Relations Section of the P. C. G. A. has three main divisions this year, each being represented by a paper at the Los Angeles meeting. The three divisions of study are from the viewpoint of the executive, the employee, and from that of service.

Oscar L. Moore, Los Angeles Gas and Electric Corporation, presented the first paper on "The Executive's Part in Public Relations." H. L. Ziegelmeyer, of the Southern California Gas Company, dealt with the subject. "Training the Employee for Better Public Relations," his paper appearing on another page of this issue. George Bowersox of the same company discussed "Improving Public Relations by Improving Service," pointing out various concrete ways in which a company can fail in its service, either through carelessness or by lack of instructions to those who are rendering the service.

At the conclusion of the meeting a joint committee from the Commercial and Public Relations Section on advertising and publicity held a short meeting.

The program of the Technical Section's two sessions speaks for itself.

PROGRAM OF TECHNICAL SECTION

Van E. Britton, division gas superintendent Pacific Gas and Electric Company, and vice chairman of the Technical Section presided in the absence of H. L. Masser, Chairman.

THURSDAY MORNING, FEBRUARY 23, 9 A. M.

Distribution Conference

PAPERS:

"Cleaning Pipe with Sand Blast," Fred Benson, Los Angeles Gas and Electric Corporation.

"Protection of Pipe Lines Against Soil Corrosion," H. L. Hiskey, Southern California Gas Company.

DISCUSSIONS:

"Protection of Pipe Lines Subjected to Water from Spray Towers," T. N. Kellett, Los Angeles Gas and Electric Corporation.

"Proper Size of Orifice for Check Caps for Testing Gas Meters."

"Methods of Boring and Forcing Pipe Under Pavements."

FRIDAY MORNING, FEBRUARY 24, 9 A. M.

PAPERS:

"Technical Methods and Equipment of the A. G. A. Laboratory at Cleveland," K. H. Flint.

"Compilation and Comparison of Safety Statistics," J. R. Rowe.

"Flange Connections for Orifice Meters," by M. J. Cereghino. (Published in this issue).

"The Introduction of Oil into Distribution Lines to Reduce Leakage," Guy Corfield, Los Angeles Gas and Electric Corporation (Published in this issue).

DISCUSSIONS:

"Installation of Pyrometers in Gas Generators."

"Treatment of Water Used in Operation of Hydraulic Valves."

"Mechanism for Providing for Quick Change of Gas Generator Oil Sprays," T. N. Kellett.

"Safety Methods in Putting Gas Holders Out of Commission for Repairs," T. N. Kellett.

Various pieces of apparatus discussed by Mr. Kellett were assembled and on display.

Friday, W. M. Thompson, president of the Reliance Manufacturing Company, was host to many of the Technical Section members at an inspection of the new Reliance plant at Alhambra, California, and at a luncheon following. In the afternoon a number of the men went through the Los Angeles Gas and Electric Corporation's gas works at Los Angeles.

PRESCOTT MEETING PROMISES TO BE INTERESTING AFFAIR

Few details are available at this date on the Arizona Utilities Association's Convention, to be held at Prescott, Arizona, April 26 and 27. However, enough is known to warrant gas men of Arizona and neighboring states planning the occasion into their April calendar. For instance, it has leaked out that one entertainment feature of the meeting will be a rendition by the Moki Indians of the nationally famous snake-dance.

Representing the Pacific Coast Gas Association, which is meeting jointly with the Arizona group, will be H. L. Masser, gas engineer of the Los Angeles Gas and Electric Corporation, and H. E. Davidson, appliance sales supervisor of the Southern California Gas Company. Mr. Masser will speak on "Practical Present Day Distribution Methods" and Mr. Davidson on "Getting New Business on Existing Mains".

SAN ANGELO GAS USE GAINS

The Western Gas Service Company of San Angelo, Texas, has recently replaced some of its two-inch line with three and four-inch mains to take care of an increase in consumers. Since October, 1927, when natural gas from North Coleman County was turned on, its patrons have increased from 575 to more than 2,000. The towns of Rowena and Miles are also served by the 70-mile line from the wells in Coleman County.

Committee Appointments

MR. R. C. BOUGHTON, Chairman of the Unaccounted For Gas Committee, Technical Section, announces that a very elaborate study will be made by the following committee:

R. C. Boughton, Chairman, Los Angeles Gas and Electric Corporation
A. R. Bailey, Los Angeles Gas and Electric Corporation
C. D. Bell, Southern California Gas Company
L. L. Biggs, Southern California Gas Company
M. J. Cereghino, Los Angeles Gas and Electric Corporation
W. M. Cobb, Los Angeles Gas and Electric Corporation
F. H. Coble, Southern California Gas Company
Oscar Cook Los Angeles Gas and Electric Corporation
W. J. Fraser, Los Angeles Gas and Electric Corporation
S. H. Graf, Oregon Agricultural College
D. J. Gray, Pacific Gas and Electric Company
Otto Goldkamp, San Diego Cons. Gas & Electric Company
W. M. Henderson, Los Angeles Gas and Electric Corporation
H. L. Hoff, Los Angeles Gas and Electric Corporation
H. L. Masser, Los Angeles Gas and Electric Corporation
E. G. McCann, Pacific Gas and Electric Company
W. L. McKee, Southern Counties Gas Company
W. F. Pape, Pacific Gas and Electric Company
D. H. Perkins, San Diego Cons. Gas & Electric Company
C. A. Renz, Los Angeles Gas and Electric Corporation
V. J. Robbins, Los Angeles Gas and Electric Corporation
Mrs. Undine Russell, Los Angeles Gas and Electric Corporation
E. H. Simmons, Los Angeles Gas and Electric Corporation
M. E. Waite, San Diego Cons. Gas & Electric Company
B. G. Williams, Southern California Gas Company

RATE STRUCTURE

C. R. Miller, Chairman of the Commercial Section, has asked L. F. Galbraith to form a committee to co-operate with the general Rate Structure Committee to be sure that the commercial aspect is fully considered. Mr. Galbraith's committee is as follows:

L. F. Galbraith, Chairman, Pacific Gas and Electric Company
C. B. Babcock, C. B. Babcock Company
G. P. Egleston, H. R. Basford Company
C. M. Grow, Southern California Gas Company
W. T. Neill, Portland Gas & Coke Company
A. A. Salmon, Spokane Gas & Fuel Company
H. E. Seagraves, Washington Gas & Electric Company
Geo. Smith, Southern Counties Gas Company
S. Terry, Aladdin Heating Corporation

ADDITIONAL APPOINTMENTS

Other appointments made since those reported in February are:

Chemical Laboratory Methods

J. M. North, Los Angeles Gas and Electric Corporation

Compressor Plants

J. W. Rawlins, Hill-Hubbell Company
V. R. Hughes, Pacific Gas and Electric Company

Gas Measurements

J. O. Wiley, Westcott & Greis, Inc.

Materials and Methods

F. M. Cota, San Diego Consolidated Gas & Electric Company

Mechanical Equipment for Field Construction Work

W. M. Frazer, Los Angeles Gas and Electric Corporation
P. C. Carroll, Los Angeles Gas and Electric Corporation

SECOND MID-WEST SALES CONFERENCE

Sales executives of gas companies in Middle Western states met for a three-day conference at the Sherman Hotel, Chicago, Illinois, February 15, 16 and 17 at the second Mid-West Sales Conference.

EDITORIAL

New Building Estimates

ONE industrial research organization estimates that during the year 1928 building construction will amount to a total of $10,000,000,000, which is meant to include both new building and repairs to existing structures.

This prospect can, to the gas company, be either hopeful or the opposite, all depending upon whether the company is prepared to get its share of the new load which is forecast in these building estimates. Have we formed our builders and architects contacts so strongly that, in our territory at least, the future gas load increase is assured? Have we in our advertising and our general contacts created an acceptance for gas in the mind of the prospective home owner?

If these quiries must be answered in the negative, the above estimate of new building construction should spur us to action. New homes must be piped for complete gas service, or an element of sales resistance will be built up that it will require years to wear down. If we act in advance the architect and builder can be made to realize that the cost of adequate piping, installed at the time of building, is much less than the value added to a home by such piping.

Those companies which have laid their groundwork wisely are selling "complete gas service" into homes equipped for it.

Educating the Largest Industry

HOME economics officials of the Iowa State College, who are about to open their second short course in domestic equipment, do so with the thought in mind that they are contributing to the solution of one of the big puzzles of the day. The world's largest industry, that of home-making, is the most backward of large industries in accepting modern equipment. Over 21 million women make up this industry's personnel in the United States alone, this number representing the active home-makers—and also the utility's ultimate market. Such courses as that which is being conducted at Ames by the Iowa State College economics department, can gather much source material for analyzing this big problem of modernizing household equipment, for they combine the viewpoints of the sales organizations and utility companies, interested in building sales and "load," with those of the home-makers who are the ones to be pleased.

We extend congratulations to those responsible for the Ames school curriculum, in that they have this year incorporated instruction in gas appliances into their program.

Gas for Gas' Sake

WE READ much in recent months—both in petroleum trade literature, and in the general press—in the line of comment on gas conservation. One tendency, evident in all of the discussion of the various current conservation programs, is to see only the immediate end—the retaining of gas pressure in oil sands to make possible a higher degree of oil recovery. This purpose is necessary and commendable, but it should not shut our eyes to the fact that stopping of gas wastage is sufficient justification in itself for a consurvation program. That gas *is* being saved for effective use—coupled with the equally important developments in gas transmission line construction, making gas available to new territory, should be widely heralded as one of the leading projects in our national program of husbanding natural resources.

Property Appearance

ON ANOTHER page of this issue there is described a system developed by the Pacific Gas and Electric Company for stimulating interest in keeping company properties up to a high standard in appearance. Space limitations make it impossible to more than suggest the set-up of the P. G. and E. plan in the published article, but any company interested in inaugurating a competitive system of "good housekeeping" will gladly be furnished with all particulars of the scheme which this west coast company has found to be workable on its complex system. Rating schedules showing the basis of awards can be provided, and inquiries will be welcomed by *Western Gas.*

Controversy Invited

HIGH pressure transmission using small mains, or low pressure transmission with necessarily larger mains—a subject of argument wherever distribution men gather. An article in this issue espouses the former system, and does it ably. Possibly there are readers of *Western Gas* who will take issue with views expressed in this discussion, and to any such we gladly offer our columns, as we have offered them in the past, for a statement of contrary opinion.

Campaigns Which Succeeded

A Direct-Selling Campaign *on* Automatic *and* Tank Water Heaters *in* San Jose Division

By J. S. C. Ross

Division Sales Manager, Pacific Gas and Electric Company, San Jose, California

¶ This group of discussions formed one unit in the "Symposium on the Domestic Load," to which the afternoon program of Friday, February 24, was given over in the Pacific Coast Sales Conference. W. S. Dicken, whose paper is included below, was unable to be present to read it at the Conference.

THE objective of the gas water heater campaign conducted in the San Jose Division of the Pacific Gas and Electric Company, from July 5th to November 30th, 1926, was to increase the water heating load by selling automatic and tank water heaters direct by the company during a brief campaign and to develop prospects to be turned over to local dealers at the expiration of the campaign.

J. S. C. Ross

All standard makes of automatic gas water heaters were listed and sold. The automatic, both instantaneous and storage, was featured.

Two or three crews of five to eight men each were employed, each crew under the supervision of a Crew Leader. Crew Leaders were paid a straight salary of $200.00 per month and the salesmen were paid a straight salary of $100.00 per month, plus a commission of $5.00 for each automatic heater sold and $2.00 for each tank heater sold.

Heaters were sold at a terms price and a discount of six per cent was given for cash, making the cash price equal to the regular list price of the heater. Installations were made by local plumbers, the consumer paying the estimated cost of the installations.

The special offer made to the consumers in this campaign was no down payment, an initial payment of $5.00 to be made on completion of the installation and the balance in twelve equal monthly payments. The above applied to automatic heaters. On tank heaters, $1.00 was paid upon completion of the installation and the balance in twelve equal monthly payments. In the case of automatic heaters, sales replacing old tank heaters, an allowance of $5.00 was given for the old tank heater which was accepted in lieu of the initial payment.

RESULTS

During twenty-one campaign weeks, we sold 481 automatic and 96 tank heaters, or a total of 577 water heaters. The total amount of the merchandise sales was $61,541.41. The total additional annual revenue secured was $21,640.00.

A total of 1802 water heater prospects was developed and turned over to local dealers after the campaign. These prospects resulted in many additional water heater sales. At least one-half of the prospects developed have later resulted in sales by local dealers.

GENERAL SUMMARY OF GAS WATER HEATER CAMPAIGN IN SAN JOSE DIVISION, PACIFIC GAS AND ELECTRIC COMPANY

July 5, November 30, 1926

	San Jose Dist. Redwood Dist. San Jose Div. July 5-Sept. 11	Sept. 13-Nov. 30	Totals
1. Total Gas Consumers	20,779	15,484	36,263
2. Number of weeks	10	11	21
3. Number of men-weeks	149	99	248
4. Number of actual interviews	11,786	9,156	20,942
5. Prospects Developed			
a. Water Heaters	1,007	795	1,802
b. Gas Ranges	114	73	187
c. Gas Heating	65	51	116
d. Total Prospects	1,186	919	2,105
6. Water Heater Sales			
a. Instantaneous	216	157	373
b. Storage	71	37	108
c. Tank	57	39	96
d. Total Sales	344	233	577
7. Total Amount of Sales	$29,796.31	$31,745.10	$61,541.41
a. Average Amount of Sale	85.50	136.25	106.66
8. Number of Sales per 100 Interviews	2.92	2.56	2.76
9. Number of pink slips	429	203	632
10. Estimated increased annual revenue from gas water heaters sold during campaign	$12,905.00	$ 8,735.00	$21,640.00

Educational Advertising Holds *the* Load

By W. S. Dicken

Sales Manager Gas Department
Puget Sound Power and Light Company
Bellingham, Washington

HISTORY has clearly and definitely established the fact that what may be considered modern today will soon be discarded for something new, something different. This is particularly true with the average housewife who has decided to purchase a new range.

Here in the Northwest where electrical competition is keen, gas men are confronted with the problem of retaining confidence in the older domestic gas appliances, the gas range in particular. Has the passing of gas lighting in favor of electric lights established a precedent? Is it possible that housewives are coming to the conclusion that they must replace their old gas ranges with electric ranges in order to be modern? Whether or not this is a fact, we do know that there have been several thousand electric ranges installed in Northwest homes during the past three years, and each year sees a large increase in sales.

W. S. Dicken

Just what are we going to do about it?

We know that the improved closed top automatic gas range with such additional features as the insulated oven and enameled linings possesses all of the advantages of the electric range. Is it not the acme of cleanliness? Can anyone question its speed? Does not the circulating heat of the oven with perfect temperature control make possible perfection of baking?

If these things are true, then why does the housewife express a preference for the electric range?

HOUSEWIFE THINKING IN TERMS OF PAST

As I see it there is only one answer: Her mental picture of a gas range is that of an old, greasy, black, box-like affair that has been in use for ten or twenty years—unsightly to look at and impossible to keep clean.

It would seem then, that our problem is one of intensive education.

With this thought in mind, we decided to try out a new scheme to teach housewives that the gas range of today is just as different from one ten, fifteen or twenty years old as a 1928 automobile is different from a 1910 model.

The plan is simply as follows: Arrangements were made with some of the local Women's Clubs to conduct luncheons for the members at the home of the hostess. An automatic Smoothtop range was taken to the home, set up in the living room or at some point where it could be seen in operation by

the guests and connected with a fifty-foot length of one and one-half inch hose to the house piping.

Our Home Service Supervisor then came on the job, prepared the luncheon and at the same time made preparation for a special demonstration of the range, timed so that it would fit in with the program. All of the advantages of this wonderful range were stressed, its cleanliness and automatic control in particular. After the demonstration, questions were solicited and finally cards were passed out on which the guests wrote their names and addresses. These were then collected and a drawing held, the winner receiving an oven dinner, cake or whatever had been prepared during the demonstration.

Aside from taking the range out and setting it up, the expense of these luncheons was largely borne by different concerns who were glad to contribute the necessary food products for the advertising value received.

Programs were mimeographed for each luncheon, giving the menu, special recipes and the names of the concerns contributing the different food products.

This work was begun in the early part of 1927 and carried through until December with an average of two luncheons each week and an average attendance of thirty ladies at each luncheon. In all about sixty luncheons were conducted.

As a result of this activity, new confidence in the gas range has been established in the minds of the majority of the eighteen hundred women who attended these luncheons. Sales during the latter part of 1927 were substantially increased over the previous year and we have every reason to believe that 1928 will show a much greater increase.

We were fortunate in securing a woman who was well qualified to handle the work. It is extremely important to have someone who first of all is enthusiastic about gas. Dignity, a keen sense of humor, and personality are likewise of prime importance in representing the best interests of the company.

An Initial Effort *in* Merchandising *in* Coast Counties' Contra Costa Division

By M. W. GAHAN
Division Manager
Coast Counties Gas and Electric Company
Contra Costa Division

IN AUGUST 1925, the Coast Counties Gas & Electric Company in Contra Costa County, inaugurated a co-operative merchandising plan through the dealers. The stove manufacturers and the Company paid a salesman a salary and 7½ per cent commission, and the dealers paid 7½ per cent to the salesman on all appliances sold. After a six months' trial, this plan was found to be impractical and was discontinued, due to the lack of co-operation from the dealers.

DECISION TO SELL DIRECT

We then decided to sell appliances direct, not only for the profit to be derived from that source, but also to increase our consumption per consumer. Having made this decision, it was necessary to standardize on the appliances which we were to sell. We selected the type of gas range with insulated ovens and closed tops only, to compete with electric ranges. The non-insulated type, closed or open tops, was used for apartment houses and for consumers desiring a medium priced range.

We then selected the instantaneous water heater, but later on found it necessary to also carry a storage type, owing to low water pressure in one or two towns, where the instantaneous could not give the desired results.

As our collections in two of the towns, having approximately 1100 consumers each, were handled by drug stores as agents, we were handicapped at the beginning for display rooms. This problem was partly solved, however, by renting space large enough for three stoves and two water heaters in department stores in each town, for a nominal sum, the owner of the stores agreeing to turn over to us all prospects and suspects as the cases might be.

Having selected our appliances and display rooms, we now employed the salesman who originally worked on the co-operative merchandising plan, and allotted him five towns, two with 1100 consumers each, two with approximately 175 consumers each, and one with 90.

We then promoted our meter reader, who had been with us for three years, to a position as service salesman, to work two towns, one with 1200 consumers, and one with 450. His duties were to go from house to house servicing appliances and selling them. This system not only gave him entree to all the consumers' homes, but also gave him valuable selling experience which he needed, furnished him prospects which he would not have been able to secure otherwise, and helped him later when he became a full-fledged salesman.

We now had two salesmen working seven towns, with approximately 4700 consumers, and after a few months we discovered it was only possible for them to obtain about one-third of the sales that could be made, owing to the widely scattered territory which they had to cover. We therefore promoted the service salesman to a salesman and allotted him one of the towns handled by the other man. This was in April 1926. We were now meeting with success far beyond our expectations, and decided to open our own offices with display rooms in the two towns formerly handled by the drug stores. By doing this we naturally increased our overhead, and therefore we looked for other means of increasing our sales.

ENLIST EMPLOYEES IN SELLING

We decided upon the plan of developing and educating all employees in our organization along the sales line from the laborer up. We employed a girl to look after the detail work in each one of our offices, and made it imperative that she should do all in her power to interest consumers in the purchase of better appliances which were on display. At all employees' meetings, we emphasized the importance of increasing our load through the sales of appliances, and urged all to hand in names of prospects who were in the market for either a stove or a heater.

Due to the cold weather from November to March, our greatest problem was, and is, how to place gas ranges and automatic water heaters where wood and coal ranges with water backs are in use. In many cases we have prevented the sale of coal and wood ranges by selling gas ranges with incinerators, and in a few cases, I am sorry to say, we were forced to install water coils. We were able, however, to remove a number of these coal ranges by allowing for them 10 per cent of the selling price connected with a gas range.

The majority of the employees, by the Spring of 1927, had enthusiastically absorbed the sales idea, and each handed in on an average of six prospects a month, which totaled approximately 180. About one-fourth of these either resulted in an immediate sale, or developed into a bona-fide prospect for the future.

To further stimulate the sales idea with the employees, the Company arranged an automatic water heater campaign in June and July, allowing each employee 10 per cent commission on the cash selling price, not connected, on any automatic water heater sold, either instantaneous or storage, and to the consumer an allowance of $5.00 on the old tank, $10.00 on a tank heater, $10.00 on an automatic combination boiler, and $10.00 on an automatic heater. Also the company requested only $4.75 as the down payment, regardless of the price of the heater purchased. The campaign ended July 31, and our sales showed that we had placed 63 automatic water heaters of the instantaneous and storage type on our lines. We felt that this was a satisfactory beginning in consideration of the fact that it was the first automatic water heater campaign in the history of the Division.

SALES LEADS FROM SERVICE TAGS

In looking over the "Improvement of Service" tags, which cover all of the servicing work each day, and on which the fitters are instructed to write a detailed story of the work performed, we noticed that in many cases old and rusty appliances were in use. The salesmen were therefore instructed to check these "Improvement of Service" orders each day, and in this way they were able to uncover a substantial number of prospects.

The latter part of last September, when we added radiant type heaters to the list of appliances which we were then selling, we had to set up an effective method for getting these heaters on our lines, in the face of a high gas rate. We added a flat charge of $5.00 for connection to our selling price, which seldom came under that amount. It was necessary to have as small a connection charge as possible to induce the consumers to have the heaters installed in their homes; and in cases where we found that we could not install them in any other way, we placed them on 30 days free trial. Out of 68 radiant type heaters sold during October and November, one-third of which were on trial, we were forced to remove only two. The increase of revenue derived from the consumption of the 68 heaters during the winter months will amount in round figures to $500, as each heater in this Division will average approximately $7.00 per month, which is a minimum. The 63 automatic water heaters which were installed on our lines in June and July increased our revenue each month approximately the same amount.

1927 RECORD SHOWS GAINS

For the year just past, we have sold 160 ranges, against 49 the year before; 87 automatic water heaters against 24; 36 tank heaters against 8; 5 restaurant ranges against 1; 3 floor furnaces against 2; 66 radiant type heaters against 3,, and also 5 insert Radiantfires and one Rotisserie. We have also four Blue Star Homes in this Division.

These sales of appliances will look very small to many, but it should be remembered that the Contra Costa Division is a very small one as to number of consumers; that one-half the consumers are the lower class of Portuguese and Italians; and also that gas rates are high.

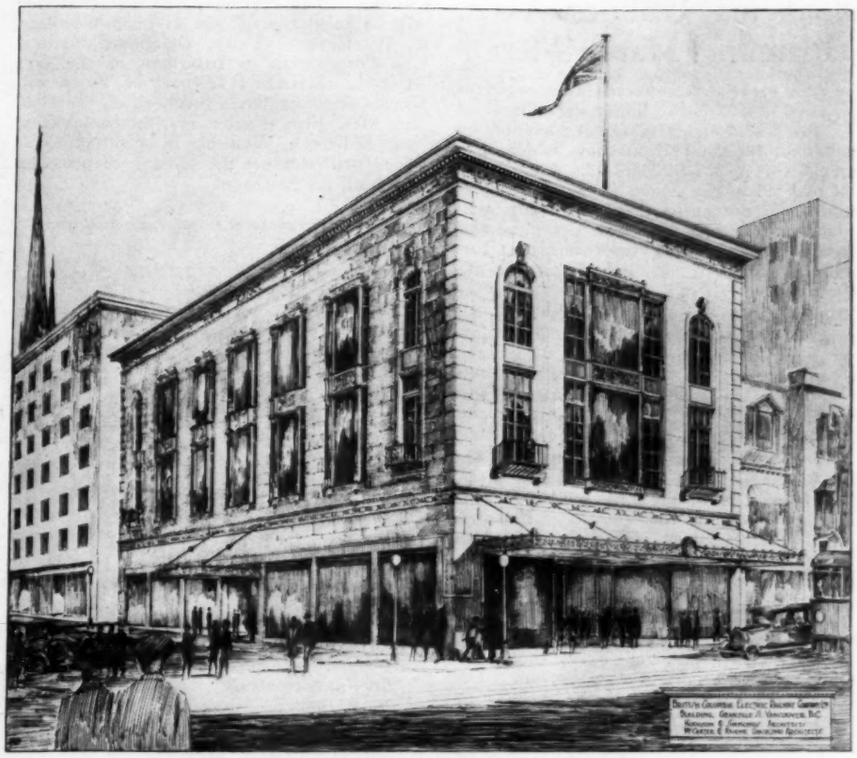
Natural Gas Convention Plans Forming

PLANS for the May 7-10 convention at Dallas, Texas, of the Natural Gas Department, American Gas Association are rapidly being brought into finished form, with all indications pointing to a large attendance and a record breaking exhibit of equipment. The convention exhibits will be housed in the Manufacturer's Building, Texas Fairgrounds, at Dallas, while convention sessions will be in the Fair Park Auditorium.

Governors and utility commissioners of five Southwestern states will be invited to attend the National Gas Department's meetings, according to the arrangements committee, of which Henry C. Morris, manager of the Dallas Gas Company, is chairman.

It is too early to make definite announcement of all program features, but some general information is available. The executive committee of the Natural Gas Department will hold a dinner and meeting on the evening of May 7th. On May 8th will come a smoker and vaudeville entertainment, while the main social event of the Convention will be the annual banquet Wednesday evening, May 9. E. R. Brown, president of the Magnolia Petroleum Company and also president of the Dallas Chamber of Commerce, and E. B. Denning, president of the Lone Star Gas Company, Dallas, have been invited to preside on this banquet occasion. Election of officers and transaction of other business of the Natural Gas Department will take place at the last session of the convention Thursday morning, May 10.

Present indications are that the exhibition space for the Dallas meeting will exceed that at Cincinnati where 1926 sessions of the natural gas men were held, 22,000 square feet of space being used. The tremendous developments in natural gas transmission and distribution in the Southwest is giving the forthcoming meeting unusual importance to equipment companies and appliance and industrial apparatus manufacturers are expected to show corresponding interest in the exhibits. An exhibition prospectus has been mailed to manufacturer companies, giving cost of booths, requirements, gas and electricity facilities, and all details. Manufacturers are requested to place their orders for space promptly, to avoid disappointment.



Artist's drawing of British Columbia Electric Railway Company's new appliance showroom, now building in Vancouver, B. C.

B. C. Electric Showroom *to be* Attractive Structure

ERECTION of a magnificent gas and electrical appliance showroom at the corner of Dunsmuir and Granville Streets, Vancouver, B. C., is now well under way for the British Columbia Electric Railway Company. The structure will be ready for occupation by the first of June of this year, and will cost approximately $200,000.

While the initial building will be three stories high, it is to be of stone and reinforced concrete construction, and capable of sustaining seven additional stories should the necessity for expansion arise.

The building will be of substantial design, presenting a dignified and pleasing exterior. It will be faced with Haddington Island stone, relieved by bronze and cast iron decorations, and finished with two canopies, one of which will extend over the entire 50-foot frontage on Granville Street, while the other will be erected over the Dunsmuir Street entrance.

The interior of the showroom is to be furnished with a view to both beauty and efficiency. A model gas equipped kitchen and a modern gas laundry will be operated in specially erected compartments for demonstration purposes. Where necessary these displays will be supplemented by electrical equipment, but with this exception the gas department will be separate from the electrical merchandising of the company. On the second floor an auditorium is being built with a seating capacity of 200, and this will be utilized for gas and electric cooking demonstrations from time to time.

Being situated at the corner of two of the principal streets of the city the windows are one of the most important points in this new sales building. These will be designed without backs so that the interior display of appliances on the ground floor can be viewed from the street even when the store is closed up, as the lights will be left on day and night.

Heavy duty gas appliances such as industrial equipment, domestic furnaces, and similar lines will be on exhibition in the basement of the new store.

GAYLORD IN PUBLIC SERVICE CO. OF COLO. COMMERCIAL DEPT.

W. M. Gaylord, formerly assistant engineer of gas utilization for the Public Service Company of Colorado, Denver, Colorado, has been transferred to the commercial department of that utility.

WANTS TO SERVE M. K. & T. SHOPS

The Gas Development Company has made application to the City Commission of Parsons, Kansas, to supply gas to the M. K. & T. railroad shops of that city.

COOLIDGE ELECTED

E. B. Coolidge has been elected president of the Treasure State Pipe Line Company, which owns the gas line from the Kevin-Sunburst Gas field to the town of Sunburst, Montana. Mr. Coolidge is president of the Hardrock Oil Company and of the Homestake Oil Company.

NEW OFFICERS FOR PACIFIC SERVICE GROUP

Pacific Service Employees Association of the Pacific Gas and Electric Company has elected officers for the year 1928, the new incumbents being J. M. Williams, president; Van E Britton, vice-president; and J. C. Carmody, executive secretary and treasurer.

TWENTY-FIVE TEXAS TOWNS ABOUT TO GET GAS

A gas line laid from the Upham gas line near Chillicothe in Hardeman County, Texas, will soon supply natural gas to approximately twenty-five towns in the vicinity of Crowell, northwest Texas. The Western Gas Company of Stamford, Texas, holds franchises in all the towns with the exception of two, Crowell and Thalia, where the Culbertson Brothers of Fort Worth have franchises. The gas from the Upham Line comes from the Panhandle fields. Towns to be served are: Crowell, Thalia, Truscott, Gilliland, Benjamin, Seymour, Vera, Knox City, Munday, Goree, Rochester, Weinert, Rule, Haskell, Rhineland, Hamlin, Stamford, Anson, Roby and Rotan. There are about five other towns in this area that will soon be added to the list.

GAS PLANT SOON TO BUILD

Announcement has been made that erection of a gas plant in Jonesboro, Arkansas, will soon be under way, the material for the plant to be on the grounds by April 1st.

Oklahoma Utilities Ass'n. Planning March Meet

LAST year's State convention registration of 800 is the minimum estimate of the Oklahoma Utilities Association on attendance for the 1928 meeting, which is to be held at Tulsa, March 13-15. All sessions will be held at the Mayo Hotel, on the sixteenth and mezzanine floors. Exhibits will be accommodated on the fifteenth floor and all available space has been contracted. Numerous speakers of national prominence are expected.

The Oklahoma association embraces all branches of the utility industry and in addition to general sessions there will be division meetings of special interest to the various groups represented in the attendance. General sessions will be held each morning and division meetings in the afternoons.

The Gas Division and the Electric Light and Power Division will hold group meetings on the 13th and 14th. The Electric Railway Division and the Manufacturers and Suppliers Division will meet on the 14th only. On the 13th there will also be a special meeting of the Public Relations Division, which will interest the public contact men and women of all divisions. On the 14th there will be a Women's Information Committee luncheon followed by a conference running well through the afternoon. The annual business meeting of the Association will be held on the afternoon of the 15th.

The president's reception and annual ball, with special entertainment features, will occur on the evening of the 13th. On the second night the annual banquet will be held. Novel entertainment features and one address always mark this occasion, which plan will be followed again this year. Honorable Charles A. Eaton, Congressman from New Jersey, will deliver this year's banquet address.

Prominent among the features of interest to gas men of the convention will be a review of the year and a forecast of the future in public relations by J. F. Owens, Oklahoma City, vice-president and general manager of the Oklahoma Gas & Electric Company; and a discussion of the advantages to public utilities available in the work of the associations, by Major Alexander Forward, New York City, managing director, American Gas Association.

"Gas" features of the division meetings will include the following:

E. L. Rawlins of Bartlesville, will discuss co-operative work between the gas association and the United States Bureau of Mines which maintains an experiment station at Bartlesville, Okla. A. E. Higgins of the American Gas Association, will explain the Blue Star Home plan. N. C. McGowan of Shreveport, La., chairman, natural gas department, American Gas Association, will be a speaker. The Gas Conservation School at Bartlesville, sponsored by the Oklahoma Utilities Association, and the Gas Metermen's Short Course held annually at the State university at Norman, Okla., sponsored by the Oklahoma Utilities Association, University of Oklahoma and the Oklahoma Corporation Commission, will be discussed by those attending the Gas Division meeting. John Zink of Tulsa, in charge of industrial heating for the Oklahoma Natural Gas Corporation, will speak on that subject. Logan W. Cary of Oklahoma City, Oklahoma Gas & Electric Company, will report on personal investigation of gas refrigeration.

Earl R. Ernsberger of Oklahoma City, president, Southwestern Light & Power Company, is president of the Oklahoma Utilities Association and will preside at the general sessions. The various division chairmen will be in charge of the division meetings. R. W. Hendee, Tulsa, Oklahoma Natural Gas Corporation, is chairman of the Gas Division. Mrs. L. P. Arnold of Tulsa will preside at the women's luncheon on the 14th, and Mrs. Elsie Carter of Oklahoma City, State chairman, Women's Information Committee, will conduct the conference program following the luncheon.

1928 Calendar

Oklahoma Utilities Association—Mayo Hotel, Tulsa, Okla., March 13, 14 and 15.

Home Economic Short Course in gas and electric equipment—Iowa State College, Ames, Iowa, March 19 to 24 inclusive.

American Gas Association, Fifth Annual Distribution Conference—Hotel Stevens, Chicago, Illinois, April 12 and 13.

Mid-West Gas Association—Lincoln, Nebraska, April 18, 19 and 20.

Arizona Utilities Association—Prescott, Arizona, April 26 and 27.

Missouri Association of Public Utilities—Jefferson City, Missouri, April 26, 27 and 28.

Southwest Public Service Association—Dallas, Texas, May 3-5.

Natural Gas Department, American Gas Association—Dallas, Texas, May 7, 8, 9, and 10.

Natural Gasoline Association of America—Tulsa, Oklahoma, May 22, 23, and 24.

Fifth Annual Metermen's Short Course—University of Oklahoma, Norman, Oklahoma, May 24 and 26.

Pacific Coast Gas Association, Northern Regional Conference—Vancouver, B. C., June 6 and 7.

Pacific Coast Gas Association, 35th Annual Convention—Hotel Coronado, Coronado, California, September 17 to 20.

American Gas Association—Atlantic City, N. J., October 8, 9, 10, 11 and 12.

IN NEW OFFICE

On February 20 the Oklahoma Gas & Electric Company opened for business in its new office building at Third and Harvey Streets, Oklahoma City. Formal opening of the building will come some time in March.

CAN NOW SERVE CITY OF 50,000 IN TUCSON

Gas storage facilities in Tucson, Arizona, will now accommodate the city of 50,000 people since the completion of the Tucson Gas, Electric Light & Power Company's new 500,000 cubic foot gas holder and 3,750 horse power Diesel engine. Max Pooler, manager of the utility at Tucson, estimates that the 50,000 mark will be reached by the year 1932.

PROTECT DOMESTIC USERS

A recent order of the Texas State Railway Commission rules that when gas pressure is low, gas distributors must give preference to domestic users over industrial plants.

$10,000,000 Line Goes Into Service *for* Dixie Gulf

THE Dixie Gulf Gas Company's 300 mile pipe line from the Louisiana fields to Houston has been completed at a cost of $10,000,000. The line, bringing 85,000,000 cubic feet of gas per day into Houston, was financed by the Moody-Seagraves Company and was completed in 94 days' time. Work was begun on the line on October 16.

The line connects, at Morringsport, La., with the Reserve Natural Gas Company line, which draws its supply from approximately 200 wells in the Northwest Louisiana fields. A half interest in the Reserve Company is controlled by the Moody-Seagraves Company.

At Goodrich an 18-inch line serving Houston and a 16-inch line serving industries at Port Arthur and Orange, branch off from the main line, which is 22-inch from Morringsport into Goodrich.

The Port Arthur line serves the Texas Company Refinery and the Pure Oil Refinery at Smith's Bluff on the Neches Canal, as well as furnishing gas for domestic consumption at Orange.

A compressor station which will increase the supply for Houston from 85,000,000 to 120,000,000 cubic feet per day, is to be built at Goodrich, it has been announced.

The new line connects with the main line of the Houston Gulf Gas Company which supplies the Houston Gas & Fuel Company near the Sinclair refinery on the La Porte Road. A. E. McKiearnan of the Dixie Gulf Gas Company was in charge of the line.

NEW P. G. AND E. ISSUE

On Tuesday, February 7th, a new issue of $20,000,000 Pacific Gas and Electric Company First and Refunding Mortgage 4½ per cent Gold Bonds, Series "E" due 1957 was offered by a syndicate including H. M. Byllesby and Company, the National City Company, American Trust Company of San Francisco, Blythe, Witter and Company, E. H. Rollins and Sons, and Pierce, Fair and Company.

EL PASO COMPANY OFFERS GAS HOLDERS FOR AIR-WAY SIGNS

Following the lead of gas companies throughout the country in encouraging the development of aviation centers, the El Paso, Texas, Gas Company has offered the use of its holders for placement of air-way signs. Large arrows illuminated at night would be painted on top of the holders as soon as El Paso has a municipal airport if the gas company's offer is accepted.

GAS PROJECT WILL SUPPLY 30 LOUISIANA TOWNS

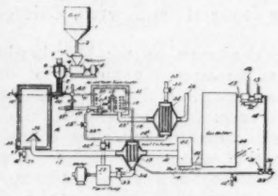
The firm of Belchic & Laskey, oil and gas operator of Shreveport, Louisiana, has purchased the gas rights on some 3,000 acres of land in the Richland Parish district of Louisiana. Gas from this source will supply approximately thirty towns in southern and southwestern Louisiana, involving construction of a pipe line tieing in the communities and the gas supply.

COAL GAS PLANT IN CLINTON

The Interstate Power Company has under construction a $20,000 coal gas manufacturing plant in Clinton, Iowa. House heating and industrial gas service as well as domestic is contemplated and the new plant will also produce 32 tons of coke daily for local distribution.

THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

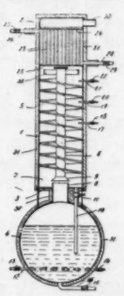
1,657,871. METHOD OF MAKING PRODUCER GAS. WALTER M. CROSS, Kansas City, Mo. Filed Apr. 28, 1927 Serial No. 187,198 2 Claims. (Cl. 48—203.)



1. A method of making producer gas, comprising the steps of charging pulverized carbonaceous material to a stage of reaction, with mixed air and steam, said air and steam being heated to or above a predetermined temperature of reaction whereby producer gas results, and automatically controlling the temperature of the air and steam mixture.

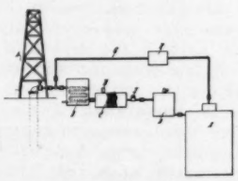
1,658,322. TREATMENT OF NATURAL-GAS GASOLINE, CASINGHEAD GASOLINE, NATURAL GASOLINE, AND THE LIKE. HAROLD B. BERNARD, Tulsa, Okla., assignor to Sinclair Oil and Gas Company, Tulsa, Okla., a Corporation of Maine. Filed July 22, 1924. Serial No. 727,444. 14 Claims. (Cl. 196—11.)

1. An improved process of treating gasoline products derived from natural gas, casinghead gas, and the like, which comprises introducing the crude gasoline product into the upper end of a tower and causing the liquid to flow downwardly therethrough in a helical path and in a substantially continuous stream in countercurrent to vaporized constituents flowing upwardly through the said helical path without spraying the liquid through the vapors or bubbling the vapors through the liquid, with-



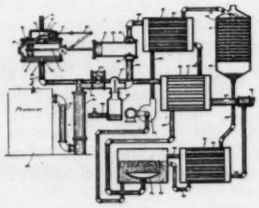
drawing the treated gasoline product from the lower end of the tower and withdrawing separated vapors and gases from the upper end of the tower.

1,658,813. PRODUCING GASOLINE FROM NATURAL GASES. ELMER B. BIRD, Little Rock, Ark. Filed Mar. 19, 1927 Serial No. 176,827. 4 Claims. (Cl. 196—10.)



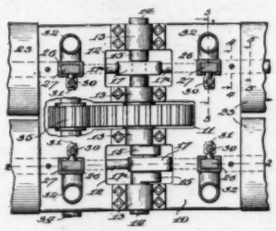
2. The process of preparing low boiling liquid hydrocarbons which comprises subjecting natural gas to intimate contact with a porous catalytic agent of common and nobler catalytic metals without mechanical pressure, and at a temperature between 400° C. and 500° C. to produce hydrocarbons which are recovered in liquid form.

1,657,045. NATURAL-GAS-DILUTION SYSTEM. HARRY F. SMITH, Dayton, Ohio, assignor to The Gas Research Company, Dayton, Ohio, a Corporation of Ohio. Filed Apr. 27, 1922. Serial No. 556,854. 10 Claims. (Cl. 48—196.)



9. A natural gas dilution system comprising, in combination, a natural gas supply pipe; a gas producer; an engine connected to said supply pipe and adapted to expand the natural gas to perform work; a pump operated by said engine and connected to said producer to withdraw generated gas from the producer under suction and compress said gas; means for effecting heat interchange between the natural gas expanded within the engine and the producer gas compressed within the pump; and separate means for connecting said heat interchanging means to a delivery main, for effecting admixture of the two gases.

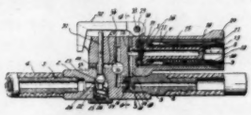
1,655,535. FUEL-BRIQUETTE MACHINE. WILLIAM C. CARPENTER, San Francisco, Calif. Filed Mar. 18, 1926. Serial No. 95,623. 2 Claims. (Cl. 25—12.)



1. In a briquette machine, a plurality of forming dies, a plurality of material feeding chambers communicating with said dies, plungers in said chamber, a plurality of tubular holders adjacent each of said forming dies adapted to register therewith, a plurality of plungers fitting said forming dies, means for reciprocating said plungers in succession in said forming dies and means for aligning one of said tubular holders with one of said forming dies during the movement of said plunger therein.

1,652,675. DEVICE FOR DIRECTING THE FLOW OF GAS FROM A GAS SUPPLY TO A GAS RECEIVER. JAMES FRANCIS KEY, Sierra Madre, Calif., assignor to First Trust and Savings Bank of Pasadena, trustee, Pasadena, Calif. Filed Oct. 17, 1923. Serial No. 669,156. 4 Claims. (Cl. 152—11.5.)

1. A device to control the flow of gas from a gas supply to a gas receiver comprising a conduit through which fluid may flow from said gas supply to said receiver, an element in said conduit having an aperture which is restricted as compared with the bore of the conduit so as

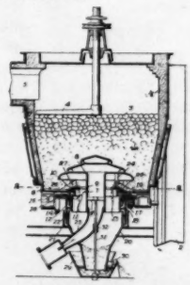


to produce a jet therein, and a fluid-operated member in communication with the zone of low pressure established by said jet.

1,655,728. BRIQUETTE AND METHOD OF MANUFACTURE. LEMUEL M. JOHNSTON and JAMES L. FARRELL, Parco, Wyo. Filed Feb. 24, 1926. Serial No. 90,409. 5 Claims. (Cl. 44—23.)

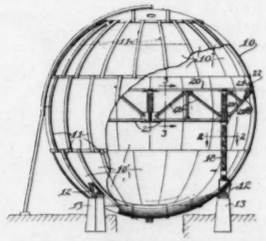
1. The method of utilizing acid tars which comprises, mixing the same with finely divided carbonaceous material, compressing the mixture into briquettes, and roasting to drive off the acid.

1,655,320. GAS PRODUCER. CHARLES W. LUMMIS, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass., a Corporation of Massachusetts. Filed July 10, 1919. Serial No. 309,859. 6 Claims. (Cl. 48—66.)



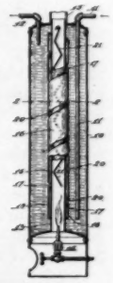
2. In a gas producer, an annular bottom for the support of the bed of fuel, a flange at the inner periphery of said bottom, whereby to maintain a depth of water on the surface of said bottom, and a device operable to crowd ashes inwardly on said bottom and over said flange.

1,651,892. GAS HOLDER. GEORGE T. HORTON, Chicago, Ill. Filed Feb. 23, 1927 Serial No. 170,259. 12 Claims. (Cl. 220—1.)



1. A gas holder comprising; a substantially spherical shell supported on legs attached to the shell on the line of a circle having a diameter substantially less than that of a great circle, an interior bracing in said shell adapted to carry a portion of the weight of substantially the upper half of said shell, said interior bracing supported in said shell on points lying substantially above said legs.

1,632,888. WATER HEATER. LEWIS F DAVIS and LOUIS W SCHNEFF, Huntington Beach, Calif. Filed Aug. 28, 1923. Serial No. 659,735. 4 Claims. (Cl. 122—150.)

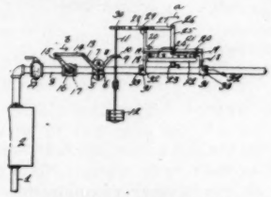


1. In a device of the character described having a water containing tank and a heating flue extending vertically therethrough, the combination with said heating flue of a restricted duct spirally disposed around said flue, said duct having a restricted opening extending along its lower edge and through which restricted opening the duct has exclusive communication with the tank contained water.

1,641,275. BURNER. PAUL C. HUGHES, Tulsa, Okla. Filed Feb. 19, 1926. Serial No. 89,382. 3 Claims. (Cl. 158—106.)

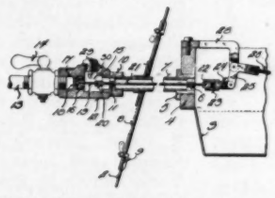
1. A burner including a gas chamber having a body portion provided with discharge openings, said gas chamber having an extension at its upper end and an inclined pendent apron carried by the extension and overlying the body portion of the gas chamber and having openings alined with the discharge openings of the gas chamber, and burner pipes mounted in the openings of the apron, said apron defining with the body portion an air space whereby the jets of gas issuing from the openings of the body portion entrain air and carry it into the burner pipes whereby a combustible mixture is produced, said burner pipes having their inner ends tapered, the walls of the openings of the apron being correspondingly tapered, said burner pipes having oppositely disposed lugs, said apron having grooves coacting with the lugs.

1,635,986. GAS CUT-OFF. FRANK EDWARD ENDE, Pontiac, Mich. Filed Jan. 18, 1927. Serial No. 161,790. 2 Claims. (Cl. 67—116.)



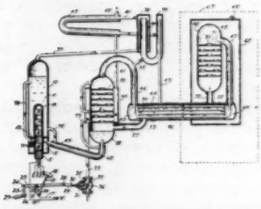
1. The combination with a gas supply pipe, a cut off valve carried by said pipe, of a thermostat control for closing said valve, said thermostat control comprising an annular thermostat above the pipe, brackets carried by the pipe for supporting said thermostat, said brackets being movable towards and away from each other, arms extending inwardly from opposite sides of the thermostat, a vertically disposed trip lever, said last named arms being pivotally connected to the trip lever at spaced points, an upwardly extending bracket carried by one side of the thermostat, a rock lever carried by said last named bracket and having one of its ends disposed in a recess in the trip lever, a weight suspended from the other end of the rock lever, a bell crank lever carried by the pipe, said weight being also suspended from one arm of the bell crank lever, an arm carried by the valve and a link connection between the other end of the bell crank lever and the arm carried by the valve.

1,648,537. HUMIDIFIER FOR HEATING UNITS. EMIL BURMEISTER, Green Bay, Wis., assignor to The Geo. Kress Co., Green Bay, Wis., a Corporation of Wisconsin. Filed June 9, 1926. Serial No. 114,684. 3 Claims. (Cl. 137—104.)



1. A humidifier for furnaces having a heating element and an outer shell, said humidifier comprising a water pan adapted to rest upon the heating element, a supply pipe adapted to pass through the outer shell and opening into the water pan, a float and float operated lever positioned within the water pan, a rod extending from said float lever through said supply pipe, a valve carried by said supply pipe and adapted to be located externally of said shell, said valve having a body portion and a movable member, said movable member being operated by said rod and said body portion having an overflow pipe mounted at a point higher than said pipe.

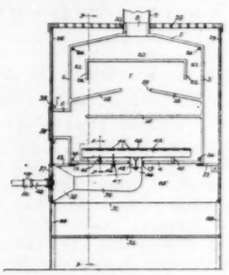
1,631,410. REFRIGERATION. NILS PERSSON, Stockholm, Sweden, assignor to Electrolux Servel Corporation, New York, N. Y., a Corporation of Delaware. Filed Mar. 9, 1927, Serial No. 173,893, and in Germany Mar. 2, 1926. 6 Claims. (Cl. 62—178.)



1. Absorption refrigerating apparatus comprising a main generator for producing vaporous refrigerant, an auxiliary generator for circulating absorption liquid, means to heat the generators and means to vary the supply of heat to the main generator while maintaining the supply of heat to the auxiliary generator constant.

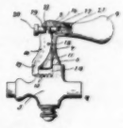
1,647,315. HEATER. WALTER G. SCHNEER, Cleveland, Ohio. Filed Mar. 9, 1925. Serial No. 14,071. 11 Claims. (Cl. 126—116.)

1. In a gas heater the combination with a rectangular sheet metal casing having upright walls, of a gas-tight rectangular cast iron radiating member supported therein and spaced from said walls to form air circulation passageways, said radiating member comprising mating members having peripheral flanges and also having internal webs forming baffle plates, said webs being arranged so as to define a combustion chamber and sinuous passageways, and a burner in said combustion chamber having



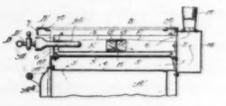
narrow horizontal slots facing the side walls of said radiating member whereby the gas flames may issue as flat sheets in close proximity to the radiating surfaces.

1,655,473. LATCH FOR GAS VALVES. BERNARD L. MICKARLSON, Sioux City, Iowa, assignor of one-half to James J. Lahey, Sioux City, Iowa. Filed July 12, 1926. Serial No. 121,950. 1 Claim. (Cl. 251—164.)



A valve comprising a casing, a control plug rotatable in said casing and having a stem extending from the casing and provided with a head at its outer end, said casing being provided with a rack extending circumferentially about a portion of the plug, the head of said stem having a bore formed therein open at its ends and extendtially about a portion of the ping, the head of said stem and extending longitudinally thereof with its inner end adapted to engage said rack and its outer end extending into the bore of said head, a handle removably carried by said head and closing one end of the bore, a latch actuating plunger slidable into and out of the bore through the other end thereof and having its inner end spaced from the end of the bore closed by said handle, the plunger being engaged with the outer end of said latch whereby movement of the plunger will move the latch into and out of engagement with said rack, and a spring in the bore confined between the handle and inner end of the plunger to yieldably resist inward movement of the plunger and normally retain the latch in engagement with the rack to secure the plug in a set position.

1,646,859. GAS RANGE. AUGUSTUS F. HARTER, Oak Park, Ill., assignor to Cribben & Sexton Company, Chicago, Ill., a Corporation of Illinois. Filed May 9 1925. Serial No. 29,097. 2 Claims. (Cl. 126—39.)



1. In a gas-range, the combination of a stove body provided with an oven and above said oven with a burner box having an open front and having a rear wall and side walls and a closed cooking top, an outlet flue communicating with the rear portion of said burner box, front and rear burners located in said burner box mixer tubes connected with said burners, and a secondary air-supply conduit within said burner box and extending parallel with the sides thereof and having its discharge orifice in said burner box located adjacent the rear burner

New Suggestions Plan *of* Empire Has Merit

THE management of the Empire Gas and Fuel Company and subsidiary companies, of Bartlesville, Okla., sees a tangible benefit accruing from the operations of its New Suggestions Plan through which employees who submit workable new ideas, designed to facilitate operation, effect economies, etc., are rewarded with monetary prizes.

This plan was formally placed in operation on July 1, 1926 and during the first 18 months 89 new suggestions were rewarded with cash prizes, ranging from $5 to $100.

Awards are made on a three-fold basis—on acceptance of the plan, for the best quarterly plan and for the best yearly plan. The amount of the award is based, wherever possible, on 10 per cent of the estimated yearly saving made possible by the suggestion. However, this 10 per cent basis cannot be rigidly adhered to, particularly in instances where suggestions deal with safety first devices. In fact the first yearly award went to the originator of a conservation and safety "bull plug" for repairing gas pipe lines. While this plan effected some economies, it was valuable principally because it helped lessen danger of injuries to workmen on pipelines.

This device provides a connection between ends of a gas pipeline that is "down" for repairs. Through a slip arrangement, the "bull plug" can be lengthened or shortened to fit sections of varying length and has the advantage of reducing gas leakage and lessening danger existing from blowouts under the old system wherein the "bull plug" was blocked in place with timbers.

Yearly awards are $100 for first prize, $75 for second and $50 for third. Quarterly awards are made by divisions of the company and carry first and second prizes for $15 and $10 respectively.

Approximately one out of every three suggestions submitted is rewarded, for nearly two-thirds of the employees' suggestions either are unworkable or are duplications of something already in use.

The Empire Gas and Fuel company, which is the natural gas and chief petroleum subsidiary of Cities Service Company, reaches approximately 5,000 employees with its New Suggestions Plan.

ANNUAL REPORT OF SOUTHERN CALIFORNIA GAS COMPANY

At the annual stockholders' meeting of the Southern California Gas Company held February 14, 1928, a report was made by President A. B. Macbeth covering the Southern's purchase of the Midway Gas Company, Valley Natural Gas Company, Central Counties Gas Company, Hanford Gas and Power Company and the River Bend Gas and Water Company, and their consolidation with the Southern California Gas Company into a corporation having properties valued at over $60,000,000. The report stated that there was approximately $3,600,000 expended in extensions and betterments during the past year, and that there was a gain of 15,101 meters during the year, bringing the total of 208-604. Two hundred and sixty-two miles of mains were laid, making a total now in operation of 4,004. In addition to improvements in the manufacturing and pumping facilities at the Colton, Calif., plant of the company, an additional eight-inch high pressure line was laid from Colton to San Bernardino, a line from Redlands to Beaumont, a 16-inch line from Calabasas to Los Angeles, and transmission mains were placed in operation from Huntington Beach and Seal Beach to connect with lines to Los Angeles.

The first financial report of the consolidated properties gives: Gross revenue for the year 1927 of $15,893,090.57. Operating expenses and taxes $10,298,192.80. Bond interest and deductions during the year $1,417,645.20. The balance available for dividends on stock, and surplus for the year, $2,771,890.61.

FIRST PUBLIC RELATIONS MEETING WELL RECEIVED

The first of a series of good will conventions to be held in various sections of Oklahoma by the public relations division of the Oklahoma Utilities Association was held in Okmulgee, February 1. About 75 representatives of utility companies and municipal water departments attended the business sessions and 250 citizens and public officials attended the evening banquet at the Okmulgee Country Club, with Mayor Dan Kenan of Okmulgee as toastmaster.

827 OUT OF 924 NEWSPAPERS OPPOSE GOV'T. OWNERSHIP

Out of 924 newspapers polled by the Joint Committee of the National Utility Associations 827 oppose government ownership and operation of public utility plants. Only 59 favor it, and 38 are undecided. Of the 59 government ownership advocates the Hearst and Scripps-Howard organization own 41. Despite the fact that all newspapers of those two groups are published in centers of population, the circulation of the newspapers opposing government ownership totals 25,500,000 against the 6,500,000 of those who favor it or are undecided.

EAST PLAINS CO. MAY SUPPLY TEXAS PANHANDLE TOWNS

The East Plains Gas Company is planning to pipe gas to small towns within the Panhandle district through a 63-mile line which will extend to Perrytown, Spearman and other communities. This is the first project under contemplation for supplying none but small towns in the Panhandle gas area.

PHILLIPS SUBSIDIARIES ELECT

Frank J. Stoltz of New York has been chosen as president of the Southern Gas Company of San Antonio, and of its subsidiaries, the Southern Utilities, Inc., and Western Gas and Fuel Company—the three companies recently acquired by the Houston Gas Securities Company of New York, a holding company for the Empire Power Corporation, also of New York. The E. L. Phillips interests control these companies as well as the Houston Gulf Gas Company, Houston Gas & Fuel Company and the Southwestern Gas Company.

The new directors for the merged companies are E. L. Phillips, Frank J. Stoltz, G. W. Olmsted, Russell F. Van Doorn, Henry R Frost, Edward G. Connette, Elmer R. Sanford and John A. McKenna, all of New York, and O. R. Seagraves, Houston. G. W. Olmsted is vice-president; C. H Dickey, San Antonio, treasurer; H A. Pagenkoff, San Antonio, secretary, and J. A. McKenna, assistant treasurer and assistant secretary.

It is thought that all of the South and Southwest Texas interests of the E. L. Phillips organizations will soon be operated under one management.

DISTRIBUTION MEN TO HOLD CHICAGO CONFERENCE

FROM April 12th to 13th will be held the Annual Distribution Conference of the American Gas Association, headquarters being at the Hotel Stevens, Chicago, Illinois.

M. I. Mix, chairman of the Distribution Committee, has announced a number of important topics for discussion at this fifth Annual Conference. J. K. Crowell, chairman of the sub-committee on pipe coatings and corrosion, will submit a report including in it particulars on work of committees of the American Petroleum Institute and the Bureau of Standards, who are also engaged in corrosion studies.

O. S. Hagerman, who heads a standing committee on pipe joints, is expected to present a report on a welded line recently completed and another paper is in preparation dealing with experience of the natural gas industry with pipe joints used in connection with high pressure transmission of gas.

J. H. Braine, of The Brooklyn Union Gas Company, will report on portable distribution equipment. In connection with this M. F. Reeder, of The Peoples Gas Light and Coke Company will present a brief statement as chairman of the Accounting Section Committee on cost of operating motors and mechanical equipment in distribution work.

Arrangements have been made for a paper on the use of bar connections on meters by E. S. Umstead, of the Providence Gas Company. The general subject of meters—domestic and industrial—will be handled by the subcommittee on this subject, of which Geo. A. Lane, of Chicago, is chairman.

Automatic devices for raising pressures at district governors, etc., will probably be treated by E. H. Enander, of the Public Service Company of Northern Illinois. Long distance high pressure transmission of gas is the subject assigned to F. A. Lydecker, of the Public Service Electric and Gas Company, and chairman of the subcommittee on that phase of gas transmission. The work of this committee will eventually be contributed as a part of the report of the committee making an economic and engineering survey of the gas industry.

Developments in dehydration of gas will be presented from the distribution engineer's standpoint, and a brief progress report with results of the research in mixed gases at the A. G. A. Laboratory is also planned.

NEW BETHEL, OKLA., LINE

A 12-inch gas line 11 miles in length is to be laid from New Bethel, Oklahoma, to the Allen, Okla., gas fields by the Allen Pipe Line Company, a recently formed organization. The line will be capable of carrying 20,000,000 feet daily. It will tie-in to the line serving Ada, Oklahoma.

NEW YORK OIL TO MIDWEST

Transfer of properties of the New York Oil Company to the Midwest Refining Company is expected to take place early in March. Terms call for cash payment of $6,000,000 with other considerations bringing cash and stock values to more than $15,000,000.

DISMANTLE NEWTON PLANT

The Southwestern Engineering Corporation, which recently purchased the Newton Process Company, is dismantling that firm's plant at Fullerton, California, the equipment being moved to Southwestern's main factory headquarters in Vernon.

PROJECT FOR INTRODUCING GAS TO MONTEREY, MEXICO

C. O. Maddox and associates are understood to be planning a natural gas transmission project to supply Monterey, Mexico, with natural gas from the Laredo district, on the American side of the Rio Grande River. The Border Gas Company of Laredo, a subsidiary of the Texas corporation, is also reported to be interested in the project, which would involve construction of a 160-mile pipe line to serve Laredo and towns en route. A number of large smelters, iron and steel works, brick manufacturing plants, nail factories and other industries are located at Laredo and would be served by the contemplated line.

SHELBY POWER PLANT WILL BE GAS USER

Natural gas engines will generate power at the Shelby, Montana, power plant of the Great Northern Utilities Company, construction on which recently began. The Shelby company is a unit of the Baehr interests and is managed by A. H. Sikes, also manager of the Great Falls Gas Company.

GRIFFIN SUPERINTENDENT OF SOUTHERN KANSAS DIVISION

J. J. Griffin, formerly with the J. B. Kirk Gas & Smelting Company of Iola, Kansas, has been made superintendent of the Southern Kansas division of the Southern Kansas Gas Company. John W. Nelson has been named as assistant to Mr. Griffin.. The Iola division of the company furnishes natural gas for Iola's domestic consumers, for the brick yards of the city, the cement plants and the United Iron Works.

REPORTED SALE OF SOUTHERN GAS COMPANY COMMON

Announcement from San Antonio, Texas, states that 55,000 shares of common stock of the Southern Gas Company have been sold to Frank J. Stolz et al of New York for $3,500,000. The same interests have within the past year bought the Houston Gulf Gas Company, Houston Gas & Fuel Company and the Southwest Gas Company.

UNITED GAS SERVICE GETS HARPER, KANSAS, CHARTER

A 20-year franchise to serve natural gas in the city of Harper, Kansas, has been granted by the city council to the United Gas Service Company of Bartlesville, Okla. The gas will be supplied from the new Empire line from the Amarillo fields to Ottawa, Kansas, and the following gas rates will prevail: 90c first thousand cubic feet, 80c for the next 24,000; 70c for the next 75,000; and 50c for the next 100,000.

The same company is now supplying gas to Arnett, Okla., Conway Springs, and Clearwater, Kansas.

GENTRY ON TOURIST BUREAU

Rufus G. Gentry, manager of public relations for the Public Service Company of Colorado, has been elected first vice-president of the Denver, Colo., Tourist Bureau.

26TH ANNUAL MEETING OF DISTRICT MANAGERS

A four-day meeting of the Pittsburgh Equitable Meter Company district managers has just been concluded. Improvements in design and construction, as well as the development of several new products in both the gas and water divisions, were discussed during the sessions.

The meeting closed with the annual banquet which is attended by all department heads of the production departments as well as the office and sales department.

PACIFIC GAS AND ELECTRIC COMPANY
GAS DEPARTMENT
MERIT PLAN AND SYSTEM OF AWARDS INSPECTION REPORT

PAGE 1

_____DIVISION_____SECTION

METER AND REGULATOR SHOPS / HOLDER STATIONS / PRODUCTION PLANTS } PROPERTY_____DATE_____19__

	MERITS Obtainable	Earned
A—GROUNDS		
Lawn	15	
Garden and Shrubs	15	
Lack of Weeds	20	
Grounds	20	
No accumulation of rubbish	20	
Curbs, walks, lighting fixtures, etc.	15	
Roads	15	
Fences and Railings	20	
Miscellaneous	10	
TOTALS		
B—BUILDINGS		
Roofs, walls, floors, doors, etc., in repair	15	
Fittings, plumbing, etc., in repair	15	
Wiring (sightly, permanent, safe)	10	
Surfaces painted	20	
Painted surfaces (not worn nor marred)	30	
Bright surfaces polished	10	
Floors, walls, or ceilings (no dust, dirt, oil, stains, smoke, markings)	20	
Windows (clean and unbroken)	40	
Screens (not broken nor rusty)	10	
Lamps and fixtures (clean and unbroken)	20	
Miscellaneous	10	
TOTALS		
C—EMPLOYEE ATTENDANTS		
Clothes and shoes (clean and orderly as work will permit)	5	
Hair and beard trim	5	
Clothes (no accumulation of soiled clothes, hung in place, orderly)	10	
Miscellaneous	5	
TOTALS		
D—RECORDS		
Log books, pressure and temperature charts	10	
Plant diagrams and blueprints	6	
Desk files orderly	5	
Miscellaneous	4	
TOTALS		

	MERITS Obtainable	Earned
E—MATERIAL AND SUPPLIES		
Materials and supplies (stored orderly, not needlessly)	40	
No excess of dispensable material	40	
No rubbish	10	
Miscellaneous	10	
TOTALS		
F—METER AND REGULATOR REPAIR SHOP		
Provers (painted, not marred, bright surfaces polished)	35	
Hand tools (in repair and orderly)	25	
Equipment (in repair, painted, cleaned, not rusty)	35	
Work in progress (arranged in orderly manner)	25	
Test records (neat and clean)	20	
Miscellaneous	10	
TOTALS		
G—HOLDERS		
Surfaces painted	20	
Painted surfaces (not worn nor marred)	20	
No gas, water, or tar leaks	30	
Guide wheels free and greased	10	
Cups and dams full	10	
Overflows open	10	
Lighting adequate and safe	10	
Auxiliary equipment good condition	10	
Other repairs not neglected	20	
Miscellaneous	10	
TOTALS		
H—COMPRESSOR AND BOOSTING PLANT		
Surfaces painted	20	
Painted surfaces (not worn nor marred)	30	
Surfaces (no dirt, dust, oil)	30	
Bright surfaces polished	10	
No leaks (gas, steam, water)	30	
Other repairs not neglected	20	
Miscellaneous	10	
TOTALS		

Inspection report form used in rating the appearance standing of P. G. and E. properties

Devising a "Good Housekeeping" System

(Continued from Page 29)

cial insignia designed to be placed on the windows.

It has only been possible here to sketch the bare outlines of the P. G. and E.'s "good housekeeping" plan, but anyone wishing more detailed information on its workings may secure it through *Western Gas*.

Attention is called to a photograph of the San Rafael gas plant, appearing on the front cover of this issue. The San Rafael plant was rated first in the production plant class and also was one of the three premium properties named regardless of class.

NEW ORLEANS INVITES BIDS ON GAS SERVICE

The New Orleans city council will award a natural gas franchise to the company that can supply gas to the city in sufficient quantities for both domestic and industrial purposes, the most cheaply and quickly, according to W. T. Hall, Public Utilities Commissioner, and to this end all types of natural gas proposals are being invited.

The engineering firm of J. W. Billingsley and Forstall, Robinson and Luqueer have been assigned by the Commission Council to the task of making a detailed survey of the prospect of bringing natural gas into the city and now has twelve men in the field investigating the situation from every viewpoint. It is hoped that a complete report from the engineering firm will be available within a month's time.

Gas is already being piped to the city gates by the Interstate Natural Gas Company. It is understood that two companies have made a bid for the city franchise.

TO SELL CITY PLANT

At an election of February 7th voters of Miami, Arizona, registered their decision to sell the city gas plant to the Arizona Edison Company.

Medium Pressure Distribution *for* Low Consumer Saturation

(Continued from Page 23)

small loss of 3.7 cubic feet per month at an average pressure of 42 pounds. This valve also had an opening in the core equal to 98 per cent of the connecting pipe area. It will be noticed that the isolation of any one section does not put any other section out of service.

PREVENTING LEAKAGE

In laying the distributing lines great care should be used. It is the object of all construction work in the medium pressure distribution system to prevent the occurrence of as many leaks as possible. . Welding has been found quite effective; therefore all lines and connections should be welded and a minimum number of rubber couplings and screw connections used. In connecting the service this same idea should be borne in mind. It would be poor policy to weld the distributing lines and then use screw couplings on the services, as it has been found that in time practically all screw joints leak. There are several methods of making continuous welded services, two methods being shown in Fig. 2; one for use during construction, the second to be used after construction when working with pressure in the mains. The first method is obvious from the illustration; the second makes use of a Tee which is drilled out and capped after being welded on the main. The first threaded coupling on the line should be the stop placed ahead of the service regulator, which will also necessarily have screw connections. A type of construction has recently come to the writer's attention, preliminary tests on which seem to show decided advantages over welding. . It is a type of rubber coupling using a "C" ring with the ends of the pipe grooved to receive an iron housing. . This has the advantage of taking up expansion, making it unnecessary to put slack in the line during construction and permitting several degrees of deflection at each joint and making the line extremely easy to maintain, as each joint is, in effect, a union. Where the distribution lines are to be laid under existing water systems and other usual obstructions, this type of construction is proving cheaper to install. Preliminary tests of the joint show it to be bottle tight both for medium and low pressures, and the rubber is especially prepared to resist oil and gas.

Choice of material and apparatus is very important. Pipe should be carefully protected against corrosion and where smaller sizes are used it would be advisable to use extra heavy in order to provide wall thickness equivalent to the larger mains. This will prevent the small lines from rusting out prematurely. The choice of service stops is important. Some stops appear to be satisfactory, but after a short period of service they become leaky. A good grade of iron stop with a brass core has been found successful. The service regulator should be of a type giving close regulation of pressure and permitting easy maintenance. The relief valve should be carefully considered since some types tend to stay open instead of shutting, causing excessive loss. All regulators placed inside residences should be vented to the open air. It should also be considered when meters are chosen that they may be placed momentarily under pressures higher than normal, should the regulator catch.

The operation of such a system as that described can be made nearly automatic by the use of devices for regulating the pressure with respect to the flow. Full advantage should be taken of the fact that a certain minimum pressure will also keep the leakage at a minimum. A pressure of 15 to 20 pounds might be necessary at peak load but three to five would be sufficient at low loads.

INSPECTION IMPORTANT

To insure minimum leakage and lowest number of complaints, routine inspection of all laterals, feeders and service regulators should be made. Also such dust traps and drips as are installed should be periodically cleaned and kept working at maximum efficiency. The use of gas at medium pressures for distribution, while not by any means providing a gas distribution Utopia, does solve certain problems and offers certain significant advantages over low pressures. There are occasions when it can not compete with the low pressure system, but it has been found advantageous in many instances and where carefully laid out, properly constructed, and operated, has been found highly satisfactory. It has been used in converting existing low pressure systems of inadequate capacity to a system having quite adequate capacity, the change-over requiring the installation of service regulators without any change in the mains. Inasmuch as we are being given more and better apparatus and materials to work with each year, we should not let certain obstacles stand in our way when they may be either prevented or overcome by improved methods of construction. A report of sub-committee "C," of the American Gas Association, at the 1927 convention, on "The Economics of Long Distance High Pressure Transmission," by F. A. Lydecker, of the Public Service Electric and Gas Company at Newark, N. J., gives very valuable information on the matter of distributing gas at medium pressures, both from the standpoint of capacities, installation and operating costs, with attention also to the pumping costs and the most economical sizes of pipe to use. Studies of this type and the frank exchange of ideas on the subject will do much for the furthering of this gas distribution method, which seems to bid fair to receive a large amount of attention in the near future. Since it has its advantages, it can not be disregarded by the gas engineer looking for means to expend his capital most efficiently.

OKLAHOMA NATURAL BOND ISSUE

Bonds of the Oklahoma Natural Gas Corporation in the sum of $14,000,000 are being offered on the New York market. According to February newspaper report the issue is being sold to finance the company's recent purchase of gas properties owned and operated by the Oklahoma Gas and Electric Company.

INDUSTRIES SOUGHT

A gas franchise which was recently granted to the Dixie Pipe Line Company by the city of Lufkin, Texas, is going to be the cause of considerable activity on the part of the chamber of commerce of that city. A budget of approximately $12,000 has been raised, the larger part of which will be spent in interesting manufacturing organizations to locate in Lufkin.

HONOLULU GAS CO., LTD., NOW IN NEW OFFICES

On January 30 the Honolulu Gas Co., Ltd., opened for business in its new office quarters at 75 South King Street, in the P. E. R. Strauch Bldg., Honolulu, T. H. All of the ground floor and most of the second floor is occupied by the gas company, with billing, bookkeeping and clerical work allocated to the second floor. The first floor will be given over to cashiers, contract department and a display of gas ranges, gas refrigerators and hot water heaters. The Honolulu company, of which Frank Q. Cannon is general manager, now has 12,500 customers.

ABBOTT ASS'T. GAS ENGINEER FOR NORTHERN STATES POWER

Amos H. Abbott, superintendent of gas distribution for the Northern States Power Company, is now assistant gas engineer for that company's properties, with headquarters in Minneapolis. Mr. Abbott's duties as superintendent of gas distribution have been taken over by D. R. Putnam, formerly assistant general superintendent. Mr. Putnam also has charge of gas manufacture.

COPPER AND BRASS ASSN. HAS FIGURES ON BUILDING

Statistics compiled by the Copper and Brass Research Association in its annual survey of the building industry revealed that buildings in the United States today have a total value of $180,370,000,000. The Association's estimate is that 1928 construction will total almost $10,000,000,000, which includes new buildings and repairs to existing structures. This 1928 estimate exceeds 1927 by $25,000,000.

NEXT MEETING OF OIL AND GAS BUREAU IN AMARILLO

The Oil and Gas Bureau of the West Texas Chamber of Commerce will hold its next convention in Amarillo, Texas according to announcement. The last convention met in San Angelo on January 26th and 27th.

SAN ANGELO TURNING TO GAS

Consumption of natural gas in San Angelo has increased from less than 600 patrons to approximately 2000 since October, 1927, when gas from Coleman county was turned into the lines. The Western Gas Service Company is having to expand its distribution system, and early in February was replacing 2-inch mains with 3 and 4-inch lines. San Angelo, Rowena and Miles, Texas, are served by the 70-mile line from the Coleman County gas field.

RESUME GREAT FALLS LINE

The Hope Engineering Company has resumed work on its Kevin-Great Falls gas line, 45 miles of which remain incompleted, no work having been done since early in December. This line is expected to be augmented in supply through the purchase of the Sunburst Oil & Refining Company's gas production in the Kevin Sunburst field.

SAN DIEGO ASSOCIATION HAS OFFICIAL JOURNAL

Volume 1, Number 1 of "The Announcer" has come off the press for the Employees Association of the San Diego Consolidated Gas & Electric Company. The editing committee of the association publication, comprise R. V. Dodge, Jr., R. B. Sperry, H. L. Mitchell and W. E. Frazer. Officers of the association are Wm. J. Wheeler, president; H. L. Mitchell, vice-president, and R. B. Tallman, secretary-treasurer.

COMMISSIONERS FAVOR MORE PUBLIC UTILITY COURSES

The National Association of Railroad and Utility Commissioners in a recent convention resolution advocated the establishment of public utility courses in all public schools and colleges.

This association comprises members of the regulatory bodies of the several states and members of the Interstate Commerce Commission. The full text of the resolution follows:

"BE IT RESOLVED by the National Association of Railroad and Utilities Commissioners in convention assembled, that it favors the establishment in public schools and colleges of a carefully prepared course of instruction on the subject of public utilities and powers and duties of regulatory commissions.

"BE IT FURTHER RESOLVED that it recommends in each of the several state commissions the desirability of communicating and co-operating with the educational authorities of their respective states, for the purpose of establishing such a course."

TENNIS COURT SURFACE FROM GAS BY-PRODUCTS

Oxide and tar, a gas by-product, has been used with success in making a tennis court in England. The oxide and tar is covered with a thin layer of sand, and the court so constructed does not have to be watered or rolled.

STAMFORD GAS CO. LINE

The Stamford Gas Company of Stamford, Texas, is constructing a gas line from the Upham line near Chillicothe to Stamford. The line, which crosses Foard County about eight miles east of Crowell, will also serve the cities of Seymore, Benjamin and Haskell.

GAS TO POWER PLANT

Gas service to the Fort Sill, Oklahoma, power plant from a new 10-inch line belonging to the Midwest Gas Company began early in February, the gas supply coming from a 50,000,000 foot well in the Grady County field.

JOINT COMMITTEE PROVIDING COPIES OF PUBLICATIONS

Copies of 32 or more publications of the Joint Committee of National Utility Associations, consisting of reprints of editorials and news articles affecting the Joint Committee and the public utility industry, may be had by addressing the committee at 420 Lexington avenue, New York City.

UNDERGROUND STORAGE IS CONSERVATION MEASURE

At the instigation of the Southern Counties Gas Company about 500,000,000 cubic feet of gas that would have been blown to the air was put into Standard Oil Company of California wells at Coyote Hills, southern California, last summer as a gas conservation measure. The Southern Counties took the risk of recovery from this experiment in underground storage, and is this winter drawing out the gas as demand warrants. Thus far, the amount which has been demanded from this storage has been but a small percentage of the amount introduced.

BILLION DOLLAR TAX BILL

More than $1,050,000,000 was paid in taxes in 1927 by the public utilities of the United States, amounting to 10 cents of every dollar paid by customers to. railroad, street railway, gas, electric light and power, express, telegraph and cable, and telephone companies—a higher percentage of gross receipts than is paid by any other corporate group.

DIGEST OF DECISIONS IS PUBLISHED BY COMMISSION

The California Railroad Commission has announced the publication of a volume compiled by that body's legal staff and entitled the "Digest of Decisions of the California Railroad Commission." Thousands of decisions of the commission made since the passage in 1912 of the Public Utilities Act in California are touched upon in the work. Copies sell at $10 and may be had from the Recorder Printing and Publishing Company, 693 Stevenson Street, San Francisco.

GAS HAS BIG SHARE IN MAKING NEW FORD

Gas is playing a major role in the making of the new Ford automobile. More than twice as much gas is used in heating processes in turning out the new car than was used to manufacture the old model, according to a statement of the American Gas Association.

The majority of the heating operations in the Fordson plant at Detroit, Mich., are done by means of gas. Fifty million cubic feet are used daily, whereas only twenty-three million were used previously.

While much of the increase in the use of gas at the Fordson plant represents the change from oil and electrically-operated furnaces, many new gas furnaces have been added to accommodate special jobs and increased production capacity. There are from 400 to 500 gas-fired units for heating processes in the plant.

A contract has also been signed by the company for a million and a half cubic feet of gas a day for its new battery plant at Albany, N. Y. The company will increase the amount of gas used to three million cubic feet within a short time.

NOT many gas companies could find such views as this above, on their properties. The new 24-inch gas pipe line of the Wyandotte County (Kansas) Gas Company is shown, at the Kansas River crossing made via an 1,800-foot bridge. This is believed to be the longest bridge in the country carrying gas main of such large size.

The home of Ivory soap is shown at the left of the distant end of the bridge—Proctor and Gamble's factory, which is being equipped to burn gas from the new line.

Western Gas reproduces the illustration above through the courtesy of "Gas Service," official semi-monthly organ of the Gas Service Company, Kansas City, Mo.

With *the* Metermen

Measurement *of* Steam *by* Orifice Meter

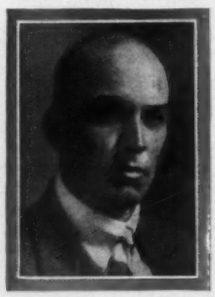
By L. F. SCHEEL and GEO. W. SALISBURY
*Union Oil Company of California**

WITH the trend towards more efficient and economical industrial operation, it has become advisable to measure the various mediums employed in the service. In a wide range of industrial plants, steam is an essential factor and the measurement of its generation and distribution has become highly important as an index to better efficiency and plant control.

The first means of measuring steam was accomplished by actually condensing and weighing the steam after its having passed through the apparatus. This necessitated the use of surface condensers. While this method was positive, it was not always practical for continuous operation. Another method employed and still used with a high degree of accuracy is to measure the feed water delivered to the boiler. However, with this system the operator obtains a check on his boiler plant only.

The Pitot tube was the first means of measuring steam flowing through pipe lines. It depended upon a constant pressure and quality of steam and had to be calibrated against some positive type of measurement. In short, it was subject to so many variables that it never gave much more than an indication of the steam flow.

Experiments with the orifice meter for measuring steam proved that we should expect equally good results as those obtained in metering air and gas by this means. The same efficiency factors for various ratios of orifice diameters to internal pipe diameters were found to apply. It was necessary only to change several factors in the gas flow formula to give the desired units in measuring steam.



Geo. W. Salisbury

The basic formula for the measurement of fluids with orifice meters has been given many times heretofore. For this discussion it will suffice if only the difference encountered in the measurement of steam as compared with the measurement of other fluids are given.

Let us take the formula,

$$Q = EA\sqrt{2gH},$$

where Q = flow in cubic feet per second, A=area of orifice in square feet; g=acceleration due to gravity in feet per second, H=differential pressure in feet of the flowing fluid, and E=the efficiency of the orifice with respect to the ratio of the orifice diameter to the internal diameter of the pipe line in which the fluid is carried. To substitute an equal for H in the above formula to obtain a differential in terms of inches of mater or h, it follows that one foot of fluid

$$\frac{w}{144}$$

is equal to a pressure of pounds per square inch and one pound pressure per square inch is equal to 27.71 inches of water at 60° F., where w is the weight of one cubic foot of the fluid. This makes H equal to $\frac{27.71 \times h}{144 \times w}$ or $\frac{5.197\ h}{w}$ and in the equation,

$$Q = \frac{E\ 2.88\ A}{\sqrt{w}}\sqrt{2gh}$$

To this, correction for the effect of water on the mercury differential is applied,

$$1 - \frac{G}{13.58}$$

where G is the specific gravity of the liquid with water as unity.

This reduces the constant to 2.19. Substituting for A the value $\frac{Pi\ d^2}{144}$, where d is the orifice diameter in inches, and for g the average value, 32.14 we have,

$$Q = E\ \frac{.09602\ Pi\ d^2}{\sqrt{w}}\sqrt{H}$$

To obtain a result in terms of pounds per hour (or W) substitute in place of the value Q, an equal expression, $\frac{W}{3600\ w}$ and we have,

$$W = E\ \ 345.4\ \ d^2\ \sqrt{h \times w}$$

Just as we are well aware of certain deviations from the perfect gas law in various natural gases, we likewise have a very definite knowledge of the variation of the pressure volume change with steam as given in several tables on properties of steam. Marks and Davis "Steam Tables" is the most popular and generally accepted. For this reason values given in this article are taken from this source.

To further reduce the above formula, certain assumptions must be made before a coefficient may be given for orifice meter installation. It is necessary to assume that the specific weight of steam varies as the absolute pressure of the steam being measured. Then with the information available on the properties of steam, a series of correction factors may be developed to correct the variation of the pressure and specific weight ratio, the quality of the steam or the degree of superheat of the steam. Such a procedure is followed in the present practice. The ratio of dry saturated steam at 100 pounds per square inch gauge is taken as 0.002241. From this ratio and by multiplying each side of the last equation by the square root of the absolute pressure (P) the formula reduces to:

$$W = E\ \ 16.36\ \ d^2\ \ \sqrt{hP}$$

Coefficients are given in Metric Metal Works bulletin No. 123, page 54, based on this formula, which, when multiplied by the extension, gives the weight of the dry steam passing through the orifice, if the gauge pressure is in the proximity of 100 pounds per square inch. If the steam is at any other pressure it is necessary to apply a correction factor derived by dividing the square root of the ratio of the specific volume and the absolute pressure of the steam under the different pressures by the square root of the ratio used in the formula, i. e.,

$$\sqrt{.002241} \text{ or } .04734$$

For pressures greater than 100 pounds the factor will be less than one, and for factors less than 100 pounds they will be greater than unity.

Since our orifice meter is acting as a weighing device, the density of the steam flowing through the orifice must be considered. If steam is superheated, its specific weight varies inversely as the degree of superheat. Therefore, the higher the superheat the less steam passes through the orifice with the same differential and conversely, wet steam carrying moisture has an increase in specific weight, proportional to the per-

**Read by Mr. Salisbury before the Southern California Meter Association, February 23, 1928.*

February 23 Program

MEETING at the Breakers Hotel, Long Beach, on the evening of February 23, members of the Southern California Meter Association listened to and discussed three principal program features. A paper on "Measurement of Steam by Orifice Meter," prepared by L. F. Scheel and Geo. W. Salisbury, Union Oil Company of California, was read by Mr. Salisbury. Guy L. Warden presented a paper on "The Republic Orifice Meter," and B. H. Laulhere of the Southern California Gas Company gave a brief discussion of "The Effect of Barometric Pressure on Gas Measurements." All of these three papers will be found in this issue of *Western Gas*.

M. J. Cereghino, chairman of the Association's program committee, announced that his committee has submitted an outline of papers covering meetings from now until June to the board of directors. This tentative advance program received the approval of the board.

Also in the line of Association business it was announced that the next meeting of the Southern California Meter Association will be held in Los Angeles on the 12th floor of the Los Angeles Gas and Electric Corporation Building, 810 South Flower Street, on March 22. A meeting place for April will be voted on at the March session.

President T. K. M. Smith made announcement in the course of the February 23 meeting that an Association "blind bogey" golf tourney is contemplated for the near future, details to be made public at an early meeting.

centage of moisture or inversely as the quality.

A diagram for obtaining the proper multiplier is given in Figure 1. For example, assume the gauge pressure of the steam flowing through the line as 150 pounds per square inch and the quality as 5 per cent, follow vertically from 150 pounds to the diagram 5 per cent line and we have on the horizontal 1.017. Or, if the steam was superheated 100° F. over the temperature of saturated steam at 150 pounds, follow up the same line to the diagonal line of 100° F. superheat and carrying across horizontally the multiplier is given as .919.

Of course, before either of these corrections is obtained, it will be necessary to determine the quality or degree of superheat of the steam. For determining moisture in the steam the throttling calorimeter lends itself quite handily for most installations. The throttling calorimeter is illustrated in Figure 4. The steam is throttled through the small, usually ⅛ inch, orifice to the atmosphere, in which process the steam is superheated at atmospheric pressure. From this temperature and the line pressure the proportion of moisture in the steam by weight may be determined from the formula given below:

$$X = \frac{H - 1150.4 - 0.47\ (t - 212)}{L}$$

Where X=proportion by weight of moisture in the steam,

H=total heat of one pound of steam at line pressure

L=latent heat of steam at line pressure

t=temperature of the calorimeter exhaust

1150.4=total heat of steam at atmospheric pressure

0.47=specific heat of saturated steam at atmospheric pressure.

The calorimeter is attached to a sampling tube, usually made from a ¼-inch or ⅜-inch pipe threaded back about four inches and with the long threaded end blanked and perforated with enough small holes to give their combined area equal to the cross-sectional area of the sampling tube. This tube should be inserted in the line about ten pipe diameters on the upstream side of the meter and in a vertical line or after a steam mixer if possible. Periodical checks on the quality should be made to insure the operator that

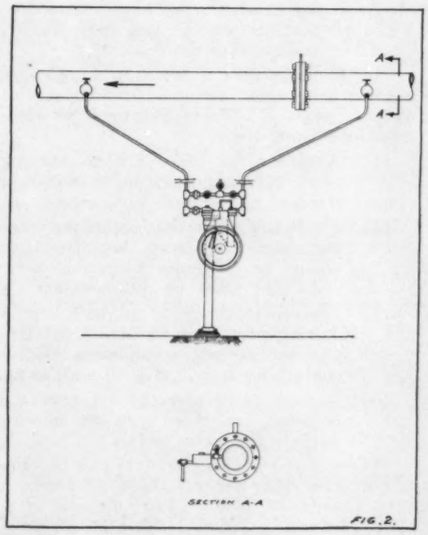


FIG. 2.

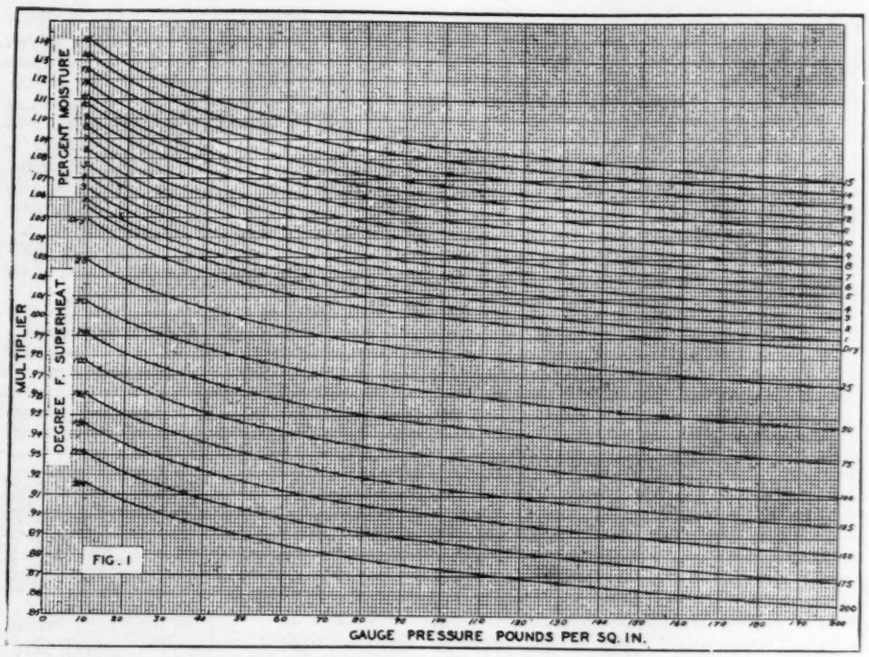


FIG. 1

the correction factor has not changed. Where the plant is large enough to justify a continuous reading of the quality, it is advisable to install a recording thermometer to obtain the calorimeter exhaust temperature. Not only does this give us a continuous record of our quality, but also discloses some valuable information on the operation of the boilers. It is very necessary that the calorimeter be well insulated, and for taking periodical readings it is necessary to allow the steam to flow through the instrument about fifteen minutes so there will be no further temperature change.

The degree of superheat may be obtained by installing a thermometer well about ten diameters or better upstream. From this, the temperature of the steam to be measured will be given, from which subtract the temperature of saturated steam at line pressure to obtain the degree of superheat.

In both cases mentioned above, it is necessary to apply a stem correction to the thermometer reading. This amounts to as much as 10° F. for ordinary steam temperatures. A simple formula for this correction is:

Error to be added=0.00009 x N (T—t) for Fahrenheit temperatures in which,

N=number of degrees of mercury column emergent from thermometer well bath,

T=temperature as indicated by thermometer,

t=average temperature of projecting mercury as measured along the mercury column.

It is sometimes desired to express the steam flow in terms of boiler horsepower, an equivalent unit which reduces steam under various pressures to a common basis. One boiler horsepower has been defined by the A.S.M.E. as the equivalent evaporation of 34.5 pounds of water per hour from and at 212° F. or the generation of 33,479 B.t.u. per hour. Therefore, to find the boiler horsepower from an orifice meter measurement, it will be necessary to multiply the total weight of the steam flowing through the orifice per hour by the heat of the liquid at boiler pressure, minus the heat of the liquid of the feedwater, plus the latent heat of vaporization corrected for the quality divided by 33,479. Expressed as a formula, this would be:

$$\text{B. H. P.} = \frac{W\ (XL + h - f)}{33{,}479}$$

Where L=latent heat of the steam under boiler pressure,

h=heat of the liquid under boiler pressure

f=heat of the liquid of the feedwater to the boiler.

Deducting 32 from the temperature of the feedwater will give this value within ½ per cent.

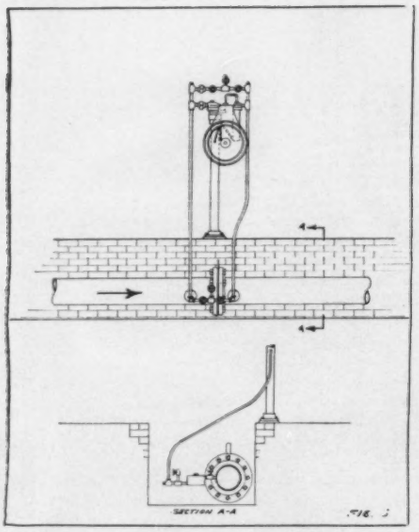
X=quality of the steam.

To illustrate how these various items are to be considered in a typical installation, we will list below the information required and substitute through with a problem:

Service—steam from two 150 B.H.P., H.R.T. boilers.

1. Date, Feb. 6th, 1928.
2. Pipe size, 6″ standard.
3. Flange, 6″ Foxboro.
4. Pipe I.D., 6.065″.
5. Orifice I.D., (4.000″).
6. Kind of plate, thin standard.
7. Type of connection, flange
8. Efficiency of plate, E.
9. Uncorrected coefficient, 16.36 E d^2 or (179.0).
10. Average of gauge pressure, 135.3 lbs. per sq. in.
11. Corrected pressure absolute, 150.0 lbs. per sq. in.
12. Quality or superheat, (97.0%).
13. Correction multiplier, (1.006).
14. Coefficient, lbs. per hour, (180.1).
15. Average feedwater temp., 212° F.
16. B.H.P. multiplier, (0.0295).
17. Meter description, 50″ Metric.
18. Chart number.
19. Miscellaneous information carried for each meter installation.

The figures in the parenthesis were calculated by the following method:



To determine the size of the plate necessary, we know the maximum demand of H.R.T. boilers is not more than 50 per cent overload; this would make a maximum demand of 450 B.H.P. or (450 x 34.5) 15,525 lbs. per hour. The extension for 50 inches at 150 lbs. pressure is 90.66; dividing the maximum flow by this extension, we obtain a coefficient of 171.3. With this we may choose the proper size orifice from a table of hourly coefficients, such as given in the Metric Metal Works bulletin No. 123. In this instance we would require a 4-inch orifice, the coefficient for which is 179.0. This is listed as item No. 9. Item No. 8 is only figured where an odd size pipe is used. This factor is sometimes referred to as the coefficient of velocity and may be calculated by the following formula, which applies to flange connections:

$$E = .606 + 1.25\ (R - .41)^2$$

where R is the ratio of the diameter of the orifice to the actual internal diameter of the pipe.

For item No. 12, suppose we obtained a temperature of 248° F. from the calorimeter exhaust. Substituting in our moisture formula, we have:

Where H=1193.4 and L=863.2,

$$X = \frac{1193.4 - 1150.4 - 0.47\ (248 - 212).}{863.2}$$

X=3% or the quality is equal to (100−3) or 97%.

Item No. 13 is taken from the correction chart or may be taken from the aforementioned bulletin. Multiplying item No. 12 by item No. 13, we have the corrected coefficient for item No. 14, in terms of pounds per hour.

Then, if it is desired that this unit be expressed in terms of B.H.P., we obtain item No. 16 by substituting in our B.H.P. formula:

$$\text{B.H.P.} = \frac{W\ [.97 \times 863.2 + 330.2 - (212 - 32)]}{33{,}479}$$

$$\text{B.H.P.} = W \times \frac{987.5}{33{,}479} \text{ or } .0295\ W$$

or our B.H.P. multiplier would be .0295.

In metering steam we encounter practically all the difficulties met in measuring gas and water. Many are corrected in the same manner and have already been discussed, so we will consider only problems we have encountered and how we have tried to solve them.

In the first place, it is impossible to keep the steam meter lines free from condensate and we cannot let the steam impart its pressure directly on the mercury in the meter. So we change mediums by installing a reservoir or condensation chamber directly on the tap from the line. These two reservoirs are installed so as to have the same fixed head of water on each side. It will be necessary to correct for this static head of water on the pressure element of the meter. It is also necessary to fill the entire system with water before placing the meter in service.

Air pocketing is one of the greatest sources of error due to the fact that this air entrapped in the reservoir will give a depressing effect on the constant head of water which must be maintained for accurate metering. It is generally acknowledged that any foreign gases in company with the steam will tend to flow along the highest point of the line. Therefore, we recommend placing the taps on the side of the line. To further avoid air pockets, we slope all connections from the reservoir to the meter and place the meter at the lowest point in the hook-up. For this same reason we recommend the use of gate valves exclusively. In one instance we resorted to ½-inch piping throughout the hook-up to overcome the difficulty.

Figure 2 shows a typical example of a meter hook-up, with the tap on the side of the line. We formerly placed our taps on the top of the line entering the center of the reservoirs, but with this method we encountered considerable trouble, because of air collecting in the meter piping. We also experienced difficulty in keeping the taps open to allow a free passage of steam and condensate. We therefore recommend 1-inch taps to the reservoirs wherever connections are made on the top of the line.

Figure 3 illustrates a meter hook-up with the reservoirs at the lowest point in the line and the meter at the highest. We have had to resort to this practice where our lines are in trenches and have experienced no trouble in supporting the columns of water in the meter lines as high as five or six feet.

Another difficulty we have encountered is that of an apparent small head registered by the differential pen, when there was no occasion for such action. We have traced this

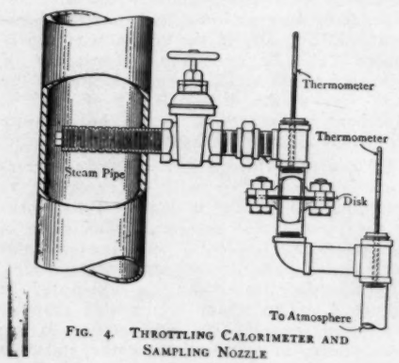


FIG. 4. THROTTLING CALORIMETER AND SAMPLING NOZZLE

irregularity and believe it to be due to condensate collecting against the upstream side of the plate and blowing over at intervals, causing a corresponding surge. This is sometimes taken care of by drilling a small hole at the bottom of the plate on the level of the bottom of the pipe. However, a better method of preventing this is to eliminate the cause by delivering dry steam.

We have tried to give in simple form a working knowledge of steam measurement, points to be considered and a few practical suggestions. Every engineer perhaps has his ideas concerning the various points discussed, just as every meter manufacturer has his own pet tap spacings. The best we can do is to accept certain standards and with these as a basis, collect data to further perfect our present methods.

The Republic Flow Meter

By GUY L. WARDEN*

REPUBLIC flow meters are designed to measure the flow of steam, water, gas and air. They are also applied to other fluids in many process operations.

Each meter unit consists of three major parts.

(1) Differential medium.
(2) Meter body.
(3) Reading instruments.

Under the first part, we can use either an orifice plate, Venturi tube, or Pitot tube with any type Republic meter. We usually recommend the orifice plate, because of:

(1) Low cost.
(2) Ease and economy of installation.
(3) Accuracy to compare with other types of differential medium.
(4) Maintained accuracy—edge does not scale up.

The meter body is the connecting link between the differential medium and the reading instruments. It translates the action of the flow through the differential medium into a proportional flow of electrical energy through the reading instruments. Various types of meter bodies have been designed to fit all conditions and requirements, ranging from low pressure, low velocity flow, up to a high pressure, high velocity flow. A pressure compensator has also been designed for low pressure lines where pressure variation seriously affects the meter results.

The reading instruments consisting of the indicator, recorder and integrator are mounted on slate panels one inch thick, completely wired, ready for service connections. These instruments may be had individually, or in any combination desired.

The Republic flow meter was the pioneer electric flow meter and has been in service over 17 years. Advantages urged for electrical operation are:

(1) Accuracy, as there are no moving parts, eliminating frictional resistance errors.
(2) Flexibility of installation, as the reading instruments can be placed at almost any distance from the meter body and point of measurement.
(3) Low operating costs, as there are no moving parts to wear out. Consumption of current at maximum load is equivalent to that of a 60 watt lamp.
(4) A very small pressure differential is required, as there are no moving parts in the meter body.

Where desired, meter records can be combined with other records, such as pressure,

*Presented before the Southern California Meter Association, February 23, 1928.

temperature, CO_2 on either a circular or strip chart. On the Republic strip chart six records can be plotted simultaneously, such as flow, temperature, CO_2, pressure or any combination desired.

For the Republic orifice, monel metal plates are used, the thickness from 1/16 inch to 1/8 inch, depending on flow conditions and pipe sizes. We also prefer to use the pipe taps adjacent to the orifice plate, and as a rule we use one pipe diameter up stream and one-third pipe diameter down stream. On the smaller pipe diameters, 2½ inches and 3 inches, it is necessary for us to supply special flanges in order to locate the down stream tap at the proper point. From Mr. Spitzglass' tests it is found that the down stream tap at 1/3 diameter is within one per cent over various orifice ratios and pipe diameters. One principal advantage of the use of the taps at the vena contracta is that it is often possible to place a small ratio orifice under most satisfactory conditions of piping, where the medium or large ratio orifice would not operate satisfactorily.

Long radius bends and expansion loops may be considered the nearest approach to a straight length of pipe. The effect of the centrifugal force is minimized by placing the pressure taps at right angles to the plane of the bend. It is always unsatisfactory to place an orifice after an elbow, while in front of the elbow low ratio orifices may be used with satisfactory results. As a general formula for orifice location we use $N-15\ r$ or $r-\frac{n}{15}$. N=No. of pipe diameters in front of orifice and r=orifice ratio d^2/D^2.

This equation emphasizes the idea that the larger orifice ratios require the longer approaches, and tests have shown that the longer the approach is, the less error is involved in the orifice coefficient.

In the electrically operated meter body, the internal resistance element, which is the rheostat of the circuit, is in the contact chamber, in which the mercury column rises and falls as the variation of flow occurs in the pipe line. In steam and water meters these bodies are filled with oil above the mercury level and in the safety seal to prevent any possibility of water getting on top of the mercury column and shorting out the resistance element.

The internal resistance, or scale, has 91 contacts arranged in three concentric rows around the center stem. The contact steps are arranged at varying heights so as to give at each step equal increments of flow. That is, the contact rods heights follow the law of squares, which represents the relation between the velocity of fluid in the pipe and the corresponding head equivalent to that velocity.

SIMPLIFIED PRACTICE GAINS IN POPULARITY

Continued growth of "simplified practice" as a means of eliminating waste in industry is evidenced by the completion during the calendar year 1927, of eighteen new Simplified Practice Recommendations, thus bringing the total projects completed to eighty, according to a review of the past year's activities of the Commercial Standards Group, Bureau of Standards, by Ray M. Hudson, Assistant Director, in charge.

ANNUAL MEETING

The San Antonio Public Service Company, San Antonio, Texas, held its annual stock holder's meeting on February 28th.

Effect *of* Barometric Pressure *upon* Gas Measurements

By B. H. LAULHERE
*Southern California Gas Company**

THIS subject, which has been the cause of much discussion, has been well covered by papers read before the Pacific Coast Gas Association and the California Natural Gasoline Association conventions last year, and published respectively in the September, 1927 and December, 1927 issues of *Western Gas*.

The barometric pressure, or absolute pressure base, as it should properly be termed, used to establish the coefficient is an arbitrary pressure and is the pressure used to establish the unit of measurement. It has no relation to the barometric pressure at the point of measurement.

B. H. Laulhere

In the past, when establishing the unit of measurement, it has been more or less customary to use the barometric pressure at the point of measurement in the coefficient. This results in different units of measurement for each barometric pressure used and the volumes obtained are not comparable. In order that gas measurements made at different locations may be comparable two conditions must be known. The first is the temperature to which the unit of measurement is referred and the second is the absolute pressure base to which it is to be referred.

It is absolutely necessary that these two conditions be known to make accurate comparisons, to compute line losses or plant efficiencies, to form comparisons with other fuels, etc.

For these reasons it is recommended that a standard pressure base be adopted.

Since the accepted standard for gas testing work and the measurement of manufactured gas is 30 inches of mercury, which corresponds to 14.73 pounds per square inch, there seems to be no good reason why a different standard should be adopted for the measurement of natural gas. Both the Pacific Coast Gas Association and the California Natural Gasoline Association have recommended the adoption of 14.73 pounds per square inch as the standard pressure base for the measurement of natural gas, and it is hoped that the Southern California Meter Association will see fit to adopt the same standard.

The barometric pressure at the point of measurement does have an important bearing on the measurement of gas, but only after the unit of measurement has been established.

The formula used for calculating the flow of gas through an orifice meter is:

$$Q=C\sqrt{Ph}$$

Q=Volume of gas passing through the orifice in cubic feet per hour.

C=A coefficient based on the specific gravity of the gas, its temperature, size of pipe, size of orifice, location of pressure connections, etc.

P=Absolute pressure of the flowing gas.

h=Drop in pressure across the orifice in inches of water.

The absolute pressure is the sum of the gauge pressure and the barometric pressure at the point of measurement. Since the present pressure extension tables are based on a barometric pressure of 14.4 pounds at the point of measurement, it is apparent that a consistent error is introduced by the use of these tables when the barometric pressure is other than 14.4 pounds. Several methods of making the necessary correction have been proposed and these are covered in detail in the papers previously referred to.

*An abstract by the author of a paper on "The Effect of Barometric Pressure Upon Gas Measurements," read before the Southern California Meter Association at Long Beach, February 23.

Flange Connections *for* Orifice Meters

By M. J. CEREGHINO
*Los Angeles Gas and Electric Corporation**

WITH the increased distribution and consumption of natural gas during the past few years, more attention has been centered upon the actual measurement of this important commodity. The orifice meter has played a very important part in the marvelous growth of the natural gas industry.

Until recently the various factors, such as gravity, temperature, size of orifice, internal diameter of pipe, have not been given sufficient attention in order to secure measurement within the allowable limits of two per cent.

Fortunately, however, the natural gas industry has come to realize that the measurement of natural gas is a very important item and one that involves thousands of dollars daily. The need therefore of a standard orifice meter set-up has long been felt and is the ultimate solution to the accurate measurement of gas.

The Natural Gas Association of America which recently joined hands with the American Gas Association, has come to realize that a standard orifice meter setup with approved orifice coefficients should be adopted. This association has been and is

*Read before the Technical Section, Pacific Coast Gas Association, at the Southern Regional Conference, Los Angeles, February 24.

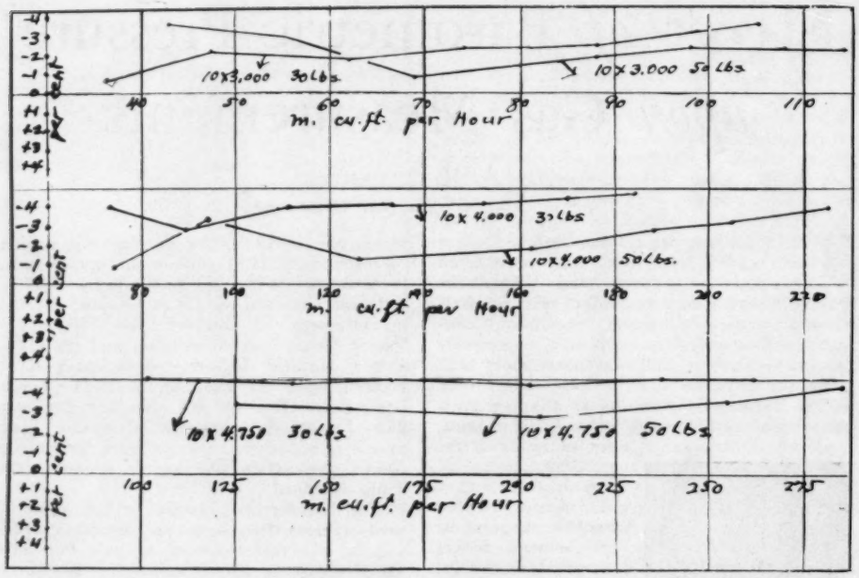


Chart No. 1

still conducting a series of extensive tests comparing the various orifice coefficients in common use with the view to determining their accuracy for gas measurement.

SEVERAL SETS OF COEFFICIENTS

The general practice during the past few years has been for the various manufacturers of orifice meter gauges to publish orifice coefficients applying to certain taps which they have adopted as standard, the result being that at the present day there are as many sets of orifice meter coefficients on the market as there are orifice meter gauges.

The most common type of meter connections used in Southern California for gas measurement are:

(1) Those using 2½ pipe diameters upstream and 8 pipe diameters downstream.

(2) Those using 1 inch upstream and 1 inch downstream.

Coefficients based on 2½ pipe diameters upstream and 8 pipe diameters downstream are published by the Metric Metal Works. Coefficients based on 1 inch upsteam and 1 inch downsteam are published by the Metric Metal Works and the Foxboro Co., Inc.

The results of tests made at various times during the past few years have led us to believe that there is a marked difference in the values obtained by using the two types of coefficients as mentioned above. This fact is brought out to some extent in the coefficients on flange connections which are published by both the Metric Metal Works and the Foxboro Co., Inc.

The following table shows a comparison of a few of the flange connections for pipe sizes from 4 to 12 inches.

The coefficients for the various sizes of pipes and orifices were tabulated and the per cent of difference between the two values obtained using the Metric Metal Works coefficients as reference.

For the small size discs in all sizes of pipe the coefficients check within 0.05 per cent. However, for ratios of orifice diameter to pipe diameter above 50 per cent, the difference is much greater, in one case the difference being 1.32 per cent.

In every instance with one exception the Foxboro coefficients were higher than the Metric Metal Works coefficients.

The values for the Foxboro coefficients were obtained from Bulletin No. 113-2, page 50. The values for the Metric Metal Works coefficients were obtained from Bulletin No. 123, pages 46 to 50.

The very fact that these two concerns do not agree on the gas coefficients for the same gauge connections leads us to believe that this is a problem which will require considerable research work to bring it to a satisfactory solution.

Size of Disc	*Metric Metal Works Value*	*Foxboro Co. Value*	*Diff.*	*% Diff.*
4x1.000	265.9	266.0	0.1	+0.04
4x2.000	1080.1	1081.0	0.9	+0.08
4x2.750	2320.0	2335.0	15.0	+0.65
6x1.000	265.9	266.0	0.1	+0.04
6x2.000	1063.5	1064.0	0.5	+0.05
6x3.000	2428.3	2433.0	4.7	+0.19
6x4.000	4800.5	4845.0	44.5	+0.93
8x1.000	265.9	266.0	0.1	+0.04
8x3.000	2393.0	2394.0	1.0	+0.04
8x5.000	7248.9	7297.0	48.1	+0.66
8x5.500	9265.4	9341.0	75.6	+0.82
10x1.000	265.9	266.0	0.1	+0.04
10x3.000	2393.0	2394.0	1.0	+0.04
10x5.000	6736.2	6758.0	21.8	+0.32
10x6.500	12436.0	12600.0	164.0	+1.32
12x2.000	1063.5	1064.0	0.5	+0.05
12x4.000	4254.1	4256.0	1.9	+0.05
12x6.000	9731.7	9731.0	0.7	—0.01
12x8.000	19329.0	19380.0	51.0	+0.26

Recently, a series of tests were conducted at the Gas Works of the Los Angeles Gas and Electric Corporation comparing the full flow and the flange connections coefficients on the same run of pipe. The tests were conducted in the presence of representatives of the Southern California Gas Company and the Southern Counties Gas Company. Two tests were run—one on a 10-inch and one on a 16-inch meter setup.

Each set-up was connected up for both full flow and flange connections. By doing this all errors due to different sizes of pipes, orifice plates, etc. were eliminated and a very convenient method of comparing the two sets of connections on the same meter hookup was afforded.

Two distinct tests were made on the 10-inch setup, one being run at 30 lbs gauge pressure and one at 50 lbs. gauge pressure. Discs of diameters of 7-inch, 6.5 inches, 5.5 inches, 4.75 inches, 4 inches and 3 inches were used on each test.

The tests were conducted at the No. 3 plant setup measuring Ventura Fuel Company Gas. It was possible to shift the flow of the gas so that the flows varying from a minimum of 24,000 to 737,000 cubic feet per hour were readily obtainable.

No corrections for temperature, gravity or barometer were necessary. Coefficients as published in the Metric Metal Works Bulletin No. 123 were used for computing the various flows.

A water column graduated in tenths of inches was connected to each set of taps. A 100 lbs. test gauge was connected to the high side of the full flow connections. This pressure was used in computing the values obtained for the full flow connections.

To obtain the pressure for computing the values for flange connections it was necessary to connect a water column between the high side of the full flow connections and the low side of the flange connections. This quantity reduced to pounds pressure was subtracted from the pressure reading on the high side of the flull flow connections, the resulting value being the pressure to be used with the flange connections.

Readings were taken on all three water columns and on the test gauge at various differentials from 5 inches to 35 inches. The data for each test were tabulated and computed to cubic feet of gas per hour. At least two separate readings were taken at each setting of the differential readings.

Orifice plates of 3, 4, 5, 6 and 7.5 inches diameter were tested in the 16 inch orifice meter setup. The tests on the 16 inch setup were conducted on redelivery Glendale gas to the Southern California Gas Company.

Two pressure gauges, one for full flow and one for flange connections, were used in obtaining the static pressures for the tests conducted on the 16 inch meter setup. In all the detail, however, the procedure was the same as the tests on the 10 inch meter setup.

All gauge connections and lines were thoroughly tested with soap suds to make certain that there were no gas leaks while the tests were being conducted.

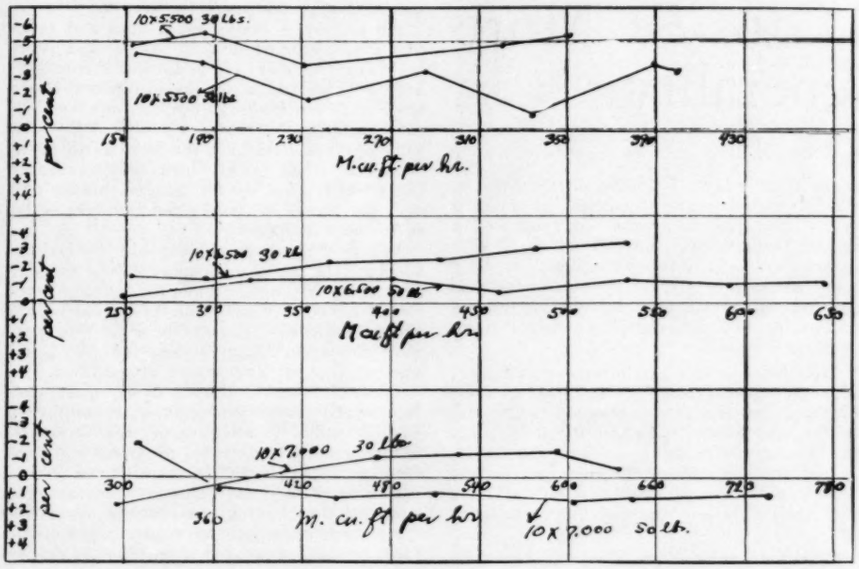


Chart No. 2

In summing up the results of the tests it may be said that at low differenials the readings on the water columns were steady. However as the flow was increased the pulsation in the water columns increased and the differentials of 35 inches were quite a factor in securing accurate readings. The fluctuations on the water column connected to the flange connections were about twice as much as those on the full flow taps.

In looking over the accompanying graphs, it may be seen that on graph No. 1 the results of tests of three plates, namely 3, 4 and 4¾, in the 10-inch setup reveal that the flange connections show values less than those for full flow connections.

In these graphs the values for flange connections are compared against those for full flow connections in per cent plus or minus. These percentages are plotted against M. cu. ft. per hour flow for each size of disc.

The values for the 3-inch disc in the 10-inch meter show an average of —2.2 per cent for 30 lbs. pressure and —2.4 per cent for 50 lbs. pressure test.

The 4 inch disc in the 10 inch meter shows an average of —4.1 per cent for the 30 lb. test and —2.6 per cent for the 50 lb. test.

The 4¾ inch disc in the 10 inch meter shows an average of —5.2 per cent for the 30 lb. test, against —3.9 per cent for the 50 lb. test.

Graph No. 2 shows results of tests on 5.5, 6.5 and 7-inch discs in 10 inch meter at 30 and 50 lbs. pressures.

The results of tests on the 5.5 inch disc shows an average of: —4.8 per cent at 30 lb. pressure and —3.0 per cent at 50 lb. pressure.

The 6.5 inch disc shows an average of —2.7 per cent at 30 lbs. pressure and —1.0 per cent at 50 lbs. pressure.

The 7.0 inch disc shows an average of —0.5 per cent at 30 lbs. pressure and plus 0.6 per cent at 50 lbs pressure.

The results in general indicate that the tests at the higher pressure show the sets of coefficients to agree more closely than at the lower pressure.

It is also evident that in all cases but one the flange connections show a lower value than the flull flow taps.

In the case of the 7-inch disc, the largest disc tested, the results indicate the closest agreement between he two sets of taps.

Graph No. 3 shows the results of tests run on the 16-inch setup.

The 3-inch disc shows the flange connections an average of minus 1.1 per cent as against the full flow taps

The 4-inch disc shows an average of minus 1.1 per cent.

The 5-inch disc shows an average of minus 3.7 per cent.

The 6-inch disc shows an average of minus 2.5 per cent.

The 7½-inch disc shows an average of minus 4.5 per cent.

The results of the 16-inch meter show the closest agreement with the small size discs and considerable difference with the larger size discs.

In summing up the results in general it may be said that there is a great deal of work to be done on coefficients and no doubt certain correction factors will have to be applied in order to secure satisfactory results.

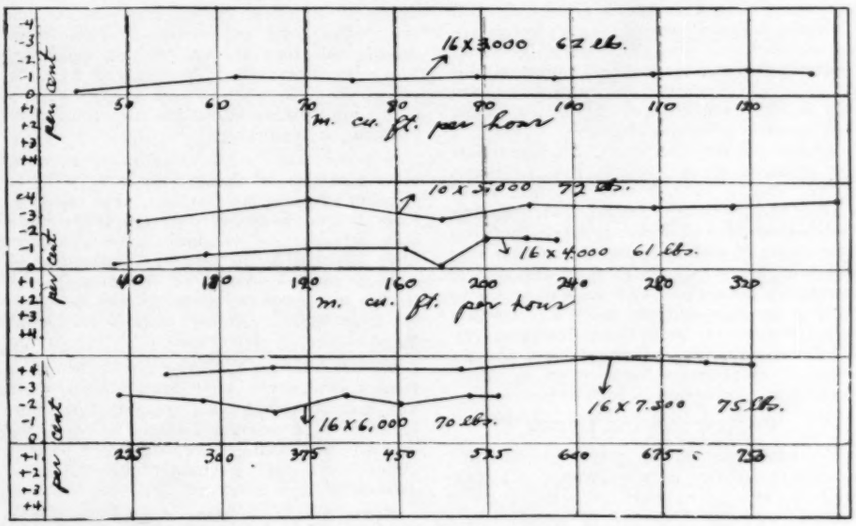


Chart No. 3

INCORPORATE AT SHREVEPORT

Moody-Seagraves Gas Company, Inc., filed a charter in January with the district clerk, Shreveport, capitalized at $100,000. O. R. Seagraves is president and W. L. Moody III vice-president and treasurer. B. A. Hardy is also a vice-president of the new concern.

DALHART TO HAVE FIRST GAS FROM DENVER LINE

According to Nelson K. Moody, president of the Prairie Oil and Gas Company, the city of Dalhart, Texas, will be the first to receive gas from the Amarillo-Denver gas line. The gas will be turned into the city mains on or before April 1st. The Dalhart Gas Company has the city franchise.

$35,000,000 YEARLY SPENT IN ASSOCIATION RESEARCH

According to a new publication of the Department of Commerce, "Trade Association Activities," it is indicated that trade associations are spending $35,000,000 a year for co-operative industries research.

HAVEN'T REACHED POINT OF SATURATION FOR GAS

The saturation point for gas is a long way in the future, if it ever is reached, is the implication of a survey made by the General Federation of Women's Clubs.

The survey covered nearly 8,000,000 homes in 2,228 communities and showed that while 75 per cent of all families living in places of from 5,000 to 100,000 population and over, have gas service, the percentage for the communities from 5,000 to 10,000 is only 54. The gas appliances in actual use also show a comparable difference. In places of 100,000 and over, 79 per cent of the families have gas ranges, while in towns between 5,000 and 10,000 population, the percentage falls to 47.9.

The answer to this situation may lie in long distance transmission of manufactured gas, thinks the American Gas Association. When economies have been effected in transmission the small communities may have the benefits of gas service through extensions from larger centers.

Public Relations Can *Be* More Than *a* Generality

(Continued from Page 26)

of meter readers and collectors to the taking of customers' complaints. Until recently we thought it advisable to restrict the taking of complaints by readers and collectors to leaks or anything involving a hazard, but we now supply them with forms for the taking of all complaints including high bills and are getting very good results.

Special care is given to the selection of employees for different types of positions. We are realizing more fully that the meter reader of today may be the District Manager of tomorrow, the collector of today may be the Sales Supervisor of tomorrow. This makes it necessary to employ only men of good initiative, and personality, even on such beginners' jobs as meter reading and collecting, expecting them to be extremely interested in the job, and to give the very best there is in them for the fulfillment of the duties of the job while they hold it. Our experience along this line impresses us with the value of employee training or encouraging the employee for self-training; also that inasmuch as meter readers and collectors jobs are generally regarded as beginners' jobs, they should be filled with promising young men, beginners in the business world. A down-and-out $300.00 Credit Manager does not make a good $125.00 Bill Collector, neither does a $300.00 Gas Engineer make a good $110.00 Meter Reader. Men having held higher paid positions generally perform these duties in a more or less mechanical way and then leave as soon as they are able to reestablish themselves. There may be exceptions to the rule, but generally the company only furnishes the meal ticket during the rehabilitation process. This accounts for the immense employment turn over in meter reading and collection departments.

CONCRETE GOODWILL EFFORTS

We have adopted the practice of waiving customers security deposits where it is possible to recognize credit established as a former customer of another company; where the customer has a good commercial rating or where the customer furnishes an acceptable guarantor. Some of these practices are not entirely new, but our policy in regard to their application has been made more liberal.

We accept telephone calls for turning on of gas, not requiring the customer to call at any of our offices to sign but arranging the application later by means of call by salesman, or mailing the application out for signature. Time is also allowed for making the required security deposit, when the customer is unable to do so at the time the arrangement is made for turning on gas.

In some Districts a letter is sent to each person whose name appears upon the list of building permits, advising this prospective customer of certain necessary measures to be considered before the meter is installed, that the company handles a complete line of appliances and also that the services of our experts are at their disposal free-of-charge to aid them in the solution of their problems. In other districts this notification and offer of service is made by salesmen.

Many new District offices equipped to transact all classes of company business and execute all classes of orders have been built for the convenience of customers. They are always placed in the main business section and are of such architecture as to be a credit to the community. In other districts not so thickly settled many agencies have been located for the customers' convenience in placing orders and paying bills. These agencies are usually located in banks or drug stores and are served by District meter men and complaint men who pick up and execute turn-on, turn-off and complaint orders direct from these agencies.

After-hour service, extending one-half hour after the regular closing time, has been established for the convenience of tardy customers who formerly rattled the door catch and went away berating the company for its lack of accommodation, and who incidentally became delinquent in the payment of their bill while awaiting another opportunity to pay.

Rush-hour service at counters frequently found necessary on busy days usually after week ends, holidays or the first day of the month is supplied by pressing into service other office help or collectors. This saves considerable time for the waiting customer, who very often gets impatient and irritable when delayed, and provides a good opportunity for training additional men for future positions of that class.

A great many other office practices have been modified or changed to have a more pleasant effect on the customer. For instance, form letters in answer to complaints have been replaced by personal letters; changes have been made in color and wording of shut-off notice or notice to discontinue service for non-payment of bills, also designating it as "Special Notice" instead of "Delinquent Notice."

Weekly bills are rendered for business customers designated as "Special Weekly" in any district, either upon request of the customer or as a measure designed to off-set the necessity for taking extremely large security deposits that are frequently objected to on account of their size.

Better public relations through employees contacts have been promoted to no less a degree by practices in operation in the field.

Pre-inspection of services have eliminated many delays in connection with new service being installed, as the details for the most part have been taken care of a few days after the service is signed for. A copy of the inspector's report sent to the main office, immediately upon the completion of the inspection is attached to the original application and supplies instant information to the customer upon making inquiry as to the progress of his order. The customer, however, is advised at the time of the inspection of any interfering conditions that are beyond the company's control.

Better service survey is being conducted all over the system by experienced fitters who enter the customers premises and make a complete check of service. While there they test for leaks, adjust appliances and do everything possible to improve the service.

One of our Districts has made a combination of Distribution Department and Customers' Department work; that is, turn-ons, turn-offs, tests, adjusts, etc., and collections, special collections, second calls and re-reads are handled by one man in a given territory. Company officials in this District believe they are building up a great deal of good will as a result of the man becoming better acquainted with the people he serves.

All employees laying main lines and services are instructed to keep all passage ways as clean and clear as possible. While laying a large main in the congested down town area not long ago our men managed to keep traffic going by the erection of wooden bulk heads to hold back the loose earth taken from the ditch. This idea was favorably commented upon by the general public and was the means of saving the company a lot of expense in hauling.

When digging to replace old or leaking services supplying residences every possible precaution is taken to leave the lawn in practically as good a condition as it was before being disturbed. Canvas is spread to prevent dirt from being worked into the grass and spoiling the appearance of the lawn.

Quite frequently people drive their cars into open or refilled ditches, although we furnish sufficient warning of their presence. We respond to these cases promptly any time of the day or night. Generally the person receiving injury or damage condemns the company for having the ditches open, but the prompt assistance we render, whether the fault be ours or not, has a tendency to nullify this ill feeling.

Pavement cutting that occasions so much harsh criticism has been materially reduced by our practice of driving services under pavement as often as possible.

Strict observance of traffic rules is required of the drivers of all company automobiles and trucks. Our men are required to give right of way and show good consideration to the general public. We believe that a careful and considerate driver in an automobile bearing the company name will make a great many friends for the company.

Careful investigations are made of complaints against employees by customers or general public, and prompt replies are given. Personal call on the complainant by Superintendent or Department Head impresses him of the company's interest in his complaint.

Untiring efforts have been put forth for the making of better public relations through employees contacts and the good results we have obtained are due to the willingness of our employees to accept any suggestions and training offered them, showing how these contacts can be improved.

COOKING SCHOOL IN SANTA ANA DRAWS 1750 A DAY

Southern Counties Gas Company, in cooperation with the Santa Ana Register, conducted a four-day cooking school February 14 to 17 at Santa Ana, California, demonstrations being attended by an average of 1750 women a day. Sessions were held at the Spurgen Theatre and demonstrations were in charge of Miss Willa Campbell, Mansfield, Ohio, home service director for the Tappan Stove Company. On the last day of the school, which included the entire Orange County in its scope, 500 women were turned away from the theatre.

During the sessions, a gas range was given away and another range was auctioned off, a canary was awarded as an attendance prize and an auction was held for another canary, the bird bringing $39.00.

HARDROCK OIL ELECTION

W. J. Johnson was re-elected president of the Hardrock Oil Company of Great Falls, Montana, at a stockholders' meeting late in January. E. B. Coolidge, vice-president, was also re-elected. R. S. Ellison and H. C. Bretschneider are members of the board of directors. Hardrock Oil Company and the Montana Gas Company furnish gas to the cities of Havre and Chinook from the Bowes field.

MOELLER AND HOUGH AT PITTSBURGH MEETING

William Moeller, Jr., manager of the Southern Caliofrnia Gas Company's Natural Gas Department, left Los Angeles February 23 to attend a meeting of the measurement committee, Natural Gas Department, American Gas Association, of which he is a member The meeting was in Pittsburgh, Pa., February 27, 28 and 29. Mr. Moeller returns to the Pacific Coast early in March.

F. A. Hough, experimental engineer, Southern Counties Gas Company, and chairman of the Pacific Coast Gas Association's measurement committee, accompanied Mr. Moeller east to attend the same sessions and he plans to visit several research laboratories in Washington, D. C., prior to his return.

TEXAS SYSTEM EXTENDED

The West Texas Gas Company has let a contract to the John W. Moore Construction Company to lay a pipe line extension from Lubbock to Lamesa and Midland, Texas. Seventy miles of 10-inch and sixty miles of 8-inch line have been contracted for. Gas, it is understood will be available in Midland by July 1 of this year.

It is reported that the same company contemplates an extension of the Texas Panhandle gas system to El Paso to bring gas to smeltering plants and refineries as well as other industrial enterprises of that city. The projected line would go from Amarillo across southeastern New Mexico to El Paso, a distance of about 350 miles, and 14-inch pipe would be used, according to the report.

REFINANCING AT PORTLAND

At the annual stockholder's meeting of the Portland Gas & Coke Company, held February 20th, a refinancing program was adopted authorizing the sale of $5,000,000 worth of preferred stock and $3,000,000 of no-par common stock. Officers and directors of the company were re-elected at the same meeting.

MANAGER AT EL DORADO

Peter Lake, of El Dorado, Arkansas, was appointed manager of the Ouachita Natural Gas Company at El Dorado early in February.

LAY MAINS IN GUTHRIE

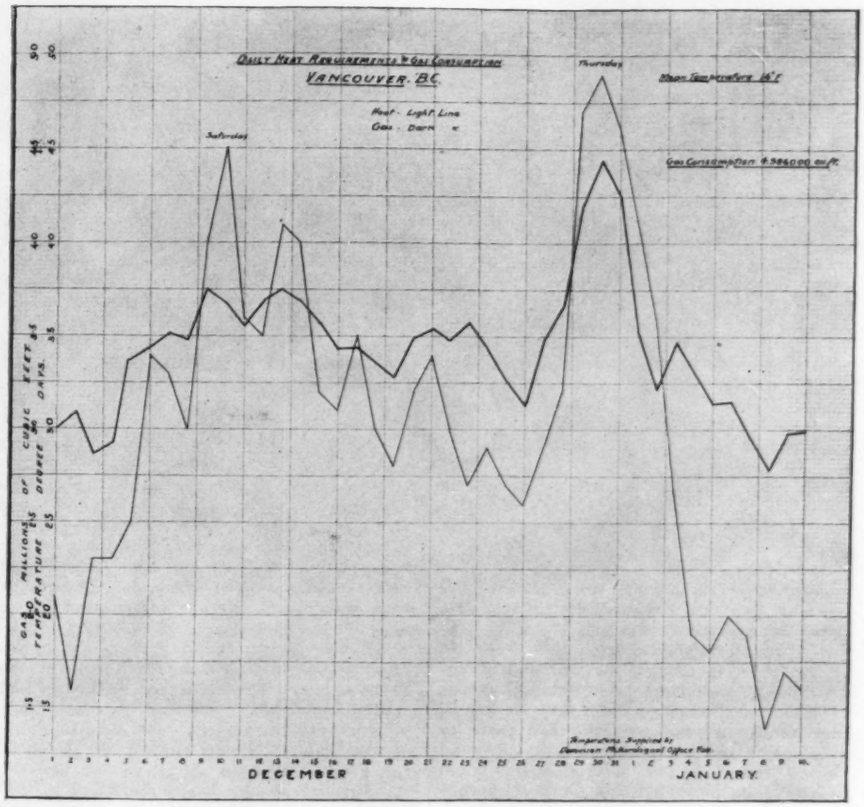
The Guthrie Gas Company is laying several miles of four-inch line in Guthrie, Oklahoma. R. H. Lussky is superintendent of the company.

TO VOTE ON POPLAR BLUFF, MO., GAS FRANCHISE

The city council of Poplar Bluff, Missouri, has voted a gas franchise to the Missouri Natural Gas Company, a subsidiary of the Utilities Power and Light Company of Chicago. The franchise, which provides that either natural gas or artificial gas be served, will be voted on at a special election to be held on March 13th. If natural gas lines are not completed within the period of two years the franchise stipulates that an artificial gas plant be constructed.

VOLZ ENGINEERING CORP.

Volz Engineering & Equipment Company, formerly located at 502 East Third Street, Los Angeles, Calif., has been purchased and succeeded by Volz Engineering Corporation, with offices at 3732-3734 East Seventh Street, Long Beach, California. In addition to Volz steam saving specialties three additional products will be marketed, including the Volz Non-Pulsating Valve Motion for duplex pumps, Volz Universal Steam Trap and the Volz Little Giant Gas and Oil Burner.



Vancouver Sendout Curve Shows Effect *of* Heating

As is shown by the accompanying chart the gas househeating load has a material influence on the sendout curve of the British Columbia Electric Railway Company, which serves gas in Vancouver, B. C. Recent cold snaps in western Canada have established new sendout records for this utility. On December 30 of last year the high record of 4,386,000 cubic feet was reached, the output for the month of December being 108,513,000 cubic feet, a 25 per cent increase over the previous high month.

"GAS COMPANY DAY" OBSERVED

On Saturday, February 25, the B. F. Mahoney Aircraft Corporation of San Diego, California, observed "Gas Company Day" as an expression of appreciation of the San Diego Consolidated Gas & Electric Company's pronounced stand in favor of the city's aeroplane industry—and in recognition too of the fact that Miss Louise Berger, an employee of the San Diego utility company, has signed up for a course in flying instruction at the Mahoney school, beginning on that date. Miss Berger is the first San Diego woman to undertake this course.

COMPLETE SPRINGFIELD WATER GAS MACHINE

A Steere water gas machine with backrun, completely erected in 13 days at the plant of the Illinois Power Company, Springfield, Ill., will be in operation during the convention of the Illinois Gas Association, March 14-15. The installation was made by The Semet-Solvay Engineering Corporation.

RESIDUE GAS STORED

The Tidal Oil Company is using an old depleted gas reservoir in the Osage region of Oklahoma to store residue gas from five gasoline plants operated in the Burbank field vicinity. This old field was drilled in 1922 and gas was sold for drilling fuel during the Burbank oil boom. Now waste gas from Burbank is being piped back to the depleted field and stored.

SMOKE ABATEMENT WORK IN SALT LAKE CITY

To aid in the smoke abatement campaign which has been under way for some time in Salt Lake City, Utah, $15,000 has been appropriated by the city council to cover expenses of smoke inspectors and abatement work for the balance of this winter. The promise of a $30,000 appropriation has already been made to cover the 1928-29 winter season expenses. The smoke abatement committee of the Salt Lake City Chamber of Commerce has instigated the present campaign and it's work is actively co-operated in by the Utah Gas & Coke Company and other organizations in the city.

BIGGEST KANSAS HELIUM FIND

Kentucky Hydrogen & Oxygen Company completed the largest helium gas well ever developed in Kansas early in February, Dobson 1, in Section 24-33-6, near Dexter, flowing 6,500,000 cubic feet daily.. After being treated in the helium plant at Dexter, the product is sold to the U. S. Navy for balloons, blimps and dirigibles.

TO BUY NEW BENCHES

The city council of Nelson, B. C., has instructed the city clerk to obtain prices on the installation of new benches at the municipal gas plant. The first new bench to be installed will replace the present No. 1 bench. There has been a steady increase in the gas consumption of Nelson during the past couple of years.

Survey Shows That Inferior Appliances Limit *the* Load

(Continued from Page 30)

have their effect not only on the present load but also on the future load. Where the equipment is faulty to the extent that its operation is unsatisfactory or dangerous, its use is very apt to be curtailed. Where the appliance is inadequate to meet the demand, certainly the proper size appliance would result in the use of more gas. Still more important is the fact that we are threatened to a certain extent by competition from other kinds of energy. This competition, particularly in certain types of appliances, will be on the increase rather than the decrease. Where the consumer is not getting satisfaction from his appliances, he makes a very good prospect for equipment using other kinds of energy, particularly if he is unaware of the real trouble.

Then too, our load is in danger of being diminished by the modern trend toward restaurants, bakeries, laundries and apartments. Even though these enterprises use gas as their fuel, the total consumption will not be as large as though the people had individually done their own cooking, baking or laundering in a residence. Appliances in poor condition encourage the housewife to avoid their use by going outside. A good kitchen range, plenty of hot water when needed, laundry appliances in perfect condition and a house well heated will do much to hold our domestic load.

As a means of keeping the consumers' equipment in good condition and advising them of unsatisfactory equipment, the house-to-house appliance survey is more than justified. In this way we can keep all the appliances possible in a usable condition and also insure the purchase of gas equipment in the future by giving the new business department leads for new appliance sales.

Editor's Note: The foregoing portion of this convention feature was read by Mr. Bailey. Mr. Brandt, who has charge of the appliance survey conducted by the Los Angeles company, presented the following as typical of the conditions met by company adjusters.

MEN who are engaged on "House Survey," encounter quite a variety of appliances. These can be classified in three groups, industrial, commercial and domestic. Since most of their work is in the residential districts they come in contact chiefly with ranges, space heaters and water heaters.

The following data taken from our weekly reports, will in a small way help to convey an idea of some of the problems our "Survey Men" are confronted with.

A FEW COMPLAINTS ON RANGES

First, we will cite some of our experiences with ranges.

When we called at one residence, the lady of the house told us that she has had trouble with her oven burner ever since she bought the range. She said that it was useless to try to adjust it because several appliance men had already failed in doing so. When we took the burner out and sawed it in half, we found three jacks obstructing the flow of gas. When they were removed and the burner was welded together again, we not only succeeded in getting a perfect adjustment, but saved her the expense of buying a new range.

At another address the consumer told us that her oven could not be used on account of the smothering flame. After straightening the oven lining to allow the products of combustion to escape, the flame did not smother. The lady said that the oven had been out of service for over five years. In another home we found steel wool in the vent opening of the range, which was causing the oven to smother. The lady said that she had asked the dealer to install a vent pipe when she bought the range. She says that the dealer told her that she was old fashioned and that "now-a-days" people place steel wool in the vent openings which "answers the same purpose."

At one apartment house visited the tenants have always been instructed never to light the oven burners because it was impossible to keep them burning for more than a few minutes. After removing the neat, tight fitting caps that had been placed over the vent collars, the ovens were found to be entirely satisfactory.

On one call we found it necessary to cut an inch and a half from each side of the oven bottom. The appliance man who had reconditioned the oven had placed a new bottom over the original one, and in doing so, had placed it up against the sides of the oven, cutting off all circulation between the burner and the vent.

It is surprising to note how many people are having trouble with their ovens and how few of them ever report the matter to our complaint department because they do not know that the trouble is easily remedied. The consumers make the remark many times during the day, when our men are leaving the houses, that they will "enjoy having hot biscuits again" since it has been made possible to heat the oven.

SAME STORY ON SPACE HEATERS

Some of our experiences with space heaters were as follows:

After peining the orifices and cleaning the burner screens many radiant type heaters have been put back into efficient service after they have been considered as worthless. Many radiant type heaters in use today were designed to burn manufactured gas. Very often it is possible to greatly improve combustion by cleaning the lint out of the screens or cross bars on the burners.

At one address we found that the radiators were not being used on account of a smothering flame. An appliance man had bent a piece of tin over the vent opening to keep the heat from going up the vent. The consumer thought that the radiators were of improper design and had fully intended to purchase radiators of another make. After bending the tin back, the products of combustion were allowed to go up the vent and the smothering condition was entirely eliminated.

In one case, according to the consumer, the furnace man had told him that it was impossible to properly adjust the furnace with the poor grade of gas being supplied by our company. Our man crawled under the house and found the main valve on the furnace line nearly closed. After opening the valve and adjusting the furnace, it was possible to get sufficient heat. The consumer had never thought about calling the gas company because he had been led to believe that nothing could be done to remedy the condition.

One water heater inspected had been out of service for over six months. After peining the orifice and removing the soot from the coils and vent, it was possible to use the heater again.

Another water heater that had not been in use for five months was put into service after installing an orifice and removing he soot. The consumer said that he could not afford to hire a plumber.

When a plumber installed one water heater which we encountered, he placed a tin disc in the vent pipe, causing the flame to go out in a few minutes. The consumer soon realized that the gas was not causing the trouble when our man removed the disc and called her attention to the immediate improvement in the flame.

At one address a rock had dropped down the water heater vent pipe about three months ago, cutting off all circulation. The heater had been out of use ever since, until our man called and remedied the trouble.

When our man called at one apartment house the manager informed him that he had already installed oil in his steam boiler and that the water heater would also be converted to burn oil in the very near future. Seeing that the water heater was getting entirely too much gas, the adjuster peined he orifices, which eliminated the lazy yellow flame and raised a sharp blue flame to the top of the fire box, with a smaller volume of gas. The manager says that he is pleased to know that it will not be necessary to install oil in the water heater.

In addition to the cases cited, there are many others too numerous to mention. It is a daily occurence for appliances to be put into service that have been out of use for some time. The consumer seldom realizes that his troubles are due to local conditions and is prone to blame the gas for everything that happens to his appliances. This bears out the theory that inferior appliances or appliances in poor working order have a decided influence in restricting gas use. The house-to-house men have considered it their duty to ferret out these cases and we believe that their work will do much to maintain our domestic as well as our commercial load.

REFERENDUM ON FRANCHISE SET FOR APRIL 17

April 17, set by the City Council of Kansas City, Kansas, as the date for calling a referendum vote on the franchise recently given the John L. Knorpp industrial gas interests in that city, has been accepted by the Knorpp interests and $12,000 has been deposited with the city treasurer to cover election expenses. According to newspaper report the outcome of this election will determine the size of the pipe line which the Knorpp interests contemplate building from Texas gas fields. The line will be 24-inch if the Kansas City, Kansas, franchise is retained, and if the franchise is recalled the line will be 22-inch, proceeding directly to Kansas City, Missouri.

17% GAIN IN OIL OUTPUT

Preliminary figures issued by the Bureau of Mines, Department of Commerce, indicate that 894,435,000 barrels of crude oil were produced and transported from producing centers in the United States last year, while the figure on total production, which will include petroleum used for fuel on the leases, and other miscellaneous items, may come to 903,000,000 barrels—an increase over 1926 of 17 per cent, accounted for in large part by increased production in the Mid-Continent district.

JUST ONE MORE CONSUMER

A. H. Sikes, manager of the Great Falls Gas Company, vouches for the authenticity of the following incident, which he says actually happened in Great Falls, Montana:

A man bearing all the earmarks of a drug addict recently appeared at the gas plant of the Great Falls Gas Company and asked for the head man. After locating the superintendent he asked him very confidentially if he could let him have some "snow."

The superintendent was perplexed and asked him to explain.

"Well," said the one in quest, "I asked a man downttown if he knew where I could get some 'coke' and he told me to go to the gas plant."

DRACHMAN IN NEW POST

P. E. Drachman, formerly salesmanager of the Arizona Power Company, Prescott, Arizona and prior to that with the Federal Light & Traction Company at Tucson, Arizona, is now commercial manager for the Peoples Light & Power Corporation, which operates gas and electric properties in 22 states from its New York headquarters.

SAVE ON FUEL COSTS WHEN GAS HEATS PUBLIC SCHOOLS

A recent testimonial to the economy of gas fuel for heating comes from E. H. Black, superintendent of public schools at Bristow, Okla., whose annual report shows a saving of $700 a year resulting from substitution of gas for coal for heating school buildings.

UTAH MEN ATTEND COAST CONFERENCE

Utah Gas and Coke Company, Salt Lake City. had two representatives at the Southern Regional Conference of the Pacific Coast Gas Association. Messrs. L. C. Olpin and A. W. Schryber, auditor and sales manager, respectively, combined a spring vacation in southern California with the Los Angeles meetings.

CHAMBER OF MINES AND OIL SCHEDULES ANNUAL BANQUET

On Thursday evening, March 8, will be held the annual banquet of the Chamber of Mines and Oils, at the Ambassador Hotel, Los Angeles.

$3,000,000 PROGRAM

The stockholders of the Kansas Gas & Electric Company of Wichita, Kansas, have voted an expansion and improvement plan which will call for the expenditure of $3,000,000. The expenditure will be financed by the sale of $3,000,000 worth of non par common stock.

BRICKELL WOULD SERVE ENID

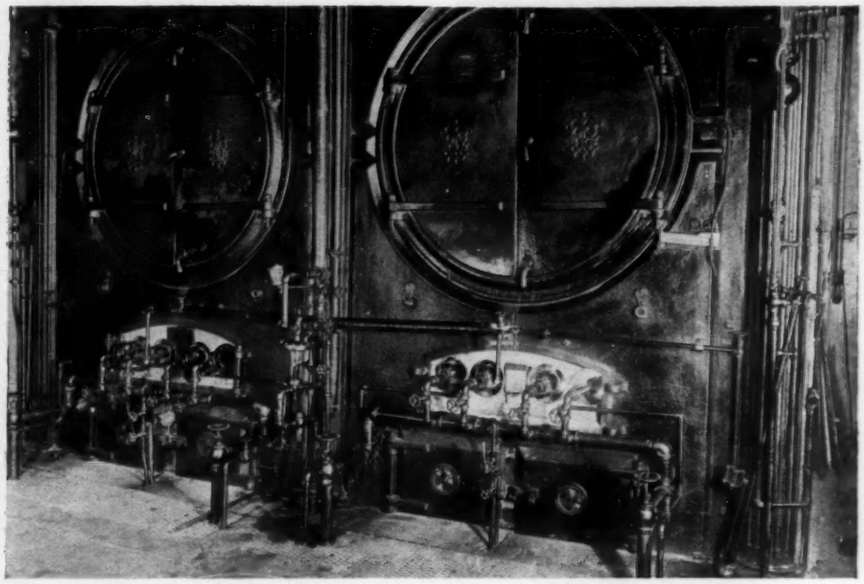
J. T. Brickell, secretary of the Brickell Gas Company, has proposed a new gas line from the Sayre, Okla. field to Enid, Okla. Mr. Brickell proposes to serve Enid's two large refineries, mills, elevators, milk condensery, brick plant and other industries with cheap industrial gas. His present proposal is industrial gas at 15 cents a thousand.

CHARLES CITY MANAGER

L. A. Lankin has assumed his new duties as business manager of the Charles City Gas Company, Charles City, Iowa, having been formerly located at Lake Geneva, Wisconsin.

HEARNE CHARTER GIVEN

The Community Gas Company has been granted a franchise to serve Hearne, Texas, with natural gas, and arrangements are under way to start work on the lines.



Installation of high pressure gas burners under two 100-B.H.P. return tubular boilers

Gas Installation *for* H. R. T. Boilers

(Continued from Page 31)

boiler installations, in which oil and gas must be fired have a grate of firebrick arranged in checker about 18 inches above the firebox floor. When using oil, this grate allows the air to come in through the ash doors and filter through the checker work to supply the required secondary air for the fuel and hold the atomized oil in suspension until it is burned. The disadvantage of this grate is that it occupies more space than is necessary for the performance of this function. The grate is unnecessary, and the same condition can be produced without sacrificing valuable combustion space.

A high furnace velocity is seldom to be desired, because it is draft, and gas pressure, that produce the proper results. It is well known that sufficient air for complete combustion must be drawn into the furnace, and that it should be thoroughly mixed with the fuel. Further, with a certain height of stack and a specific temperature difference the stack will draw a definite volume of air through an opening. If this opening will not admit enough air induced by this draft, it is useless to put more fuel into the furnace than can be burned. This point and the preceding one explain the unsatisfactory operation of many boilers, regardless of the kind of fuel used. A poor draft condition can be remedied to some extent by using high pressure gas burners. The high pressure gas going into the furnace definitely directs the flow of the gas through the furnace.

The flow of the gases should be only as rapid as necessary to carry off the burnt gases. This means that the damper should be regulated in accordance with the boiler load. This method of operation reduces the excess air in the flue gas, and gives a fuel comparison some value.

From the information briefly assembled above, stationary engineers should be able to determine whether their existing installations incorporate advanced principles of gas utilization, or whether modifications might improve operating conditions.

DAN COYLE WITH HOT-N-KOLD

Dan Coyle, formerly of the San Jose office of the Pacific Gas and Electric Company, has joined the Hot-N-Kold Corporation organization as assistant to the president, C. H. Dickey, Jr. Mr. Coyle will have charge of matters of office detail and systematization of the interior organization of this new corporation.

P. G. AND E. GAS MEN'S CLUB SHOWS GOOD GROWTH

The Harbor View Club, social and athletic organization of the Gas Distribution Department and the Meter Repair Shop of the P. G. and E.'s Oakland works, boasts over 15 years continuous existence.. Organized in 1913, it had but 16 members consisting of the entire staff of meter and complaint men of the East Bay property at the time. . Of these original 16, incidentally, 12 are still active members of the club—now grown to over 200.

A basketball team of the first order represents the club in games with other industrial teams, and other members of the group indulge in volley ball, horseshoes, or other sports. A high degree of proficiency has been reached by the Safety First teams, of which there are four, and these are constantly in demand to give demonstrations before various organizations.

Meetings are held monthly, at which time new appliances and methods in the business of gas making or meter work are explained, and outside speakers are called upon for talks on matters of special or general interest.

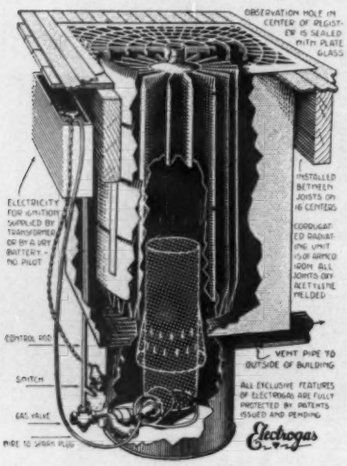
W. A. Beeson is president for 1928.

LIQUID GAS IN LAS VEGAS

The Clark County Gas Company is now supplying consumers in Las Vegas, Nevada, with natural gas in liquid form, a product of higher hydro-carbon fractions marketed by the Standard Oil Company.

ELECTROGAS

it's matchless!


OBSERVATION HOLE IN CENTER OF REGISTER IS SEALED WITH PLATE GLASS
INSTALLED BETWEEN JOISTS ON 16 CENTERS
CORRUGATED RADIATOR UNIT IS OF ARMCO IRON ALL JOINTS OXY ACETYLENE WELDED
VENT PIPE TO OUTSIDE OF BUILDING
ALL EXCLUSIVE FEATURES OF ELECTROGAS ARE FULLY PROTECTED BY PATENTS ISSUED AND PENDING
Electrogas

—a good floor furnace
—approved by A. G. A.
—three sizes

ELECTROGAS FURNACE CO.
Rialto Bldg.
SAN FRANCISCO

The Cleveland Trencher Company

"Pioneers of the Small Trencher"

**20100 ST. CLAIR AVE.
Cleveland, O., U.S.A.**

New Business Success *at* Topeka *and* Hutchinson

MORE proof of what aggressive new business methods can accomplish is seen in results recently announced for the Capital Gas and Electric Co., at Topeka, Kansas, and the Hutchinson Gas Company, at Hutchinson, Kansas.

Previous to 1925 the domestic revenue of the Capital Gas and Electric Company had been decreasing at the rate of about 10 per cent per year. In June, 1925, intensive new business work began at Topeka, with the appointment of Martin B. Buckley as new business manager. Comparative figures have a story to tell: In the year ending June 1, 1925, 46,100 cubic feet per meter were sold. The year ending January 1, 1928, reflects a sale per meter of 65,500 cubic feet, a gain during this interval of about 20 per cent in cubic foot sales per meter. In the year ending June 1, 1925, there was a revenue per meter of $46.31. The year ending January 1, 1928, showed a revenue per meter of $56.11 or a gain during this time of about 21 per cent.

Major activities during this period were confined to furnace house heating installations and 1527 were made during this time. During this same period the new business department sold $702,688 worth of appliances making a total of 9,046 major appliances sold in this time.

This advance in cubic foot sales and revenue was obtained on a meter basis, with an increase of 1006 meters in the period concerned.

The Hutchinson Gas Company, from the period December, 1922, to July, 1925, suffered a decrease in annual revenue of 14.6 per cent. This decrease was in the face of an increase of customers of 5.6 per cent. Annual sales per customer had dropped during this time from $62.58 to $49.37 or a decrease of 21.1 per cent.

An active sales policy was inaugurated with the establishment of a new business department in July, 1925 when the gas property was acquired by Doherty interests. During a subsequent period of 25 months the new business department placed on the lines 1857 gas consuming appliances with a net sales value of $147,697. Consumption per customer in cubic foot sales has increased from 67,389 to 90,383, or 34.2 per cent, even with 340 new customers (8.2 per cent) added to the lines in this period. Smither Merrill, now connected with the Toledo Edison Company, and A. M. Grall, who is the present new business manager at Hutchinson, were instrumental in setting up the record detailed above.

COLORADO COMMUNITIES PLAN FOR NATURAL GAS

City commissioners of Pueblo, Colo., have set April 6 as the date for a special municipal election to vote on a new gas franchise and rates for natural gas, to be supplied by the Amarillo-Denver line. The Pueblo Gas and Fuel Company requested that the election be deferred a month from the original date set, March 6, in order that time for registration of voters might be allowed.

With more than 100 miles of line from the Amarillo end already laid, and with work begun from the Denver terminus on February 8, the $22,000,000 project to bring Texas natural gas to homes and industries Denver and other Colorado communities begins to take rapid shape. Completion to Denver will come by September 1, it is now estimated.

Colorado Fuel and Iron Company engineers are drawing plans for introducing gas into the Pueblo plant as soon as it is available.

FARGO LINE REPORTED

A natural gas transmission line from Montana fields across North Dakota to terminate at Fargo, the project to cost approximately $3,800,000 is contemplated by the Montana-Dakota Power Company, according to February newspaper reports.

INDUSTRIAL GAS CHARTER IS GIVEN IN EAST ST. LOUIS

The East St. Louis city council has voted a 25-year franchise to the Cahokia Manufacturers Gas Company, which is a subsidiary of the Illinois Light & Power Company, to supply industrial gas in that city. The franchise will be subject to a referendum vote in April. Other towns in the East Side district have granted the same type of franchise, and it is understood that the source of the gas is to be Louisiana fields.

11.3% GAIN IN TAXES

Taxes paid by manufactured gas companies in America in 1926 increased 11.3 per cent, making the total tax bill for the year come to $46,000,000.

DECEMBER SALES DOUBLE 1926 ON GAS FIRES

Salesmen of the British Columbia Electric Railway Company's gas department at Vancouver, B. C., did some hustling during the month of December. This is not usually a month when new records for gas range and gas fire sales are established, but the close of 1927 saw the December sales more than double that of the same month the previous year. In all 19 hot plates, 80 ranges, 118 gas fires, 4 vacuum gas heating systems, 18 tank heaters, 5 automatic water heaters, and 10 industrial furnaces were sold by the salesmen, in addition to a large quantity of miscellaneous gas appliances and equipment.

HOUSTON SURVEY MADE

A. C. Howard, engineer for the United Gas and Electric Company, has recently been in Houston, making a survey anticipating the extension of gas service within the city. The United Gas and Electric Company is one of the E. L. Phillips interests, which control the Houston Gas Securities Company of New York, the Houston Gas and Fuel Company and the Houston Gulf Gas Company.

ADD TO MARSHALL STORAGE

A 50,000 cubic foot capacity addition has been made to storage facilities at the Marshall, Mo., gas plant of the Missouri Gas & Electric Service Company, giving a total holder storage of 100,000 cubic feet.

SIX UNIT GASOLINE PLANT

A six-unit gasoline plant is being constructed by the Magnolia Petroleum Company in Section 15-7-4, in the St. Louis pool area of Pottawatomie county, Oklahoma.

MINNEAPOLIS BODY SEES NATURAL GAS POSSIBILITIES

According to newspaper report the Civic & Commerce Association of Minneapolis is interesting itself in the possibility of a natural gas supply to be developed in Montana and piped into Minnesota for utilization in the Twin Cities.

PHOENIX UTILITY HAS GOOD GAS SALES YEAR IN 1927

A good year in gas appliance merchandising is reported in Phoenix, by the Central Arizona Light and Power Company. According to A. F. Moriarity, general sales-manager for the utility, 663 gas ranges were sold in 1927, against 457 in the year previous. A total of 247 water heaters, as compared to 156 in 1926, was sold last year.

The Phoenix utility has approximately 12,500 consumers in that city, and of this number 9,573 use gas for cooking, which is an increase of 1,048 over last year. There was also an increase of 1,850 cubic feet in the average annual consumption per gas user, as of November 1927 over November 1926.

Like many another "combination" company, selling both gas and electric services, the Central Arizona Light and Power Company is faced by the problem of so conducting its advertising that patrons in outlying districts where gas mains have not yet penetrated may be persuaded to cook by electricity—and at the same time keep electric ranges out of the gas district. To meet this situation the company has been conducting its advertising to electric range prospects off the gas mains by direct mail, the general city advertising in newspapers featuring the more efficient and economical gas range for cooking.

GAS HELPS TO PRODUCE BOTTLE-TIGHT JAILS

A St. Louis manufacturer boasts of turning out an escape-proof jail cell. Application of automatically controlled gas heat, he says, makes it possible to produce bars and plates that will dull the edge of any saw, file or drill slipped into a prison by an obliging friend. To add to the gloom of hopeful inmates, he tells of a specially treated laminated steel bar which cannot be annealed or softened even by a gasoline torch.

INTERNATIONAL SAFETY MEET AT NEW YORK IN OCTOBER

Dates for the seventeenth annual International Safety Conference are October 1, 2, 3, 4, and 5. Sessions will be held at New York City. The Executive Committee of the National Safety Council expects attendance to exceed the Chicago convention figure of last year, which was 6000.

WEST TEXAS GAS CO. PLANS GASOLINE UNIT

The West Texas Gas Company, subsidiary of Prairie Oil & Gas Company, now operating a gas line from the Panhandle of Northwest Texas to Amarillo and into the south plains region, has announced plans of building an absorption plant nine miles northwest of Amarillo, Potter County. Location of the plant is in Section 35, block B-2, of A. B. & M. Survey.

GASOLINE GROUP DISCUSSES CHARCOAL TEST

A discussion of the "Proposed Tentative Standard Pressure Charcoal Test" featured the California Natural Gasoline Association's February 9th meeting at the Alexandria Hotel, Los Angeles.

CHANGES IN CHAMBER TITLES

Edwin Higgins, secretary of the Chamber of Mines and Oil for the past four years, has been given the title of Managing Director and Secretary, with a place on the Chamber's board of directors. David S. Kilgour, who was formerly auditor of the Chamber, has been made assistant secretary and auditor.

PORTLAND MODEL HOMES ARE GAS EQUIPPED

On January 29 the Oregonian West Coast Woods Model Home, sponsored by the West Coast Lumber Bureau and built by Henderson-Bankus, Inc., was completed and opened to the Portland, Ore., public. In addition to featuring the use of outstanding west coast woods, the new structure is practically a "Blue Star Home," in which are included the gas appliances: refrigerator, period design radiant type heater, range, hot water storage system, washer, ironer, incinerator, clothes dryer, and a specially designed Gasco briquet bin with portable feed equipment.

Another beautiful model home opened in Portland simultaneously with the West Coast Woods home is the Oregonian Master Model Home, sponsored by the Home Owners' Institute and built by Henderson-Bankus, Inc. Heating will be by an automatic gas-fired boiler and hot water will be supplied through a gas-fired hot water storage system.

NATURAL GASOLINE MEN HOLD FORTH IN MAY

May 22, 23 and 24 are the dates for the 1928 convention of the Natural Gasoline Association of America, headquarters this year being in the Mayo Hotel, Tulsa, Okla. S. C. Carner of the Roxana Petroleum Corporation heads the program committee for the annual meeting, its other members being E. L. Peck of the Empire Gasoline Company, and Emby Kaye of the Skelly Oil Company.

According to A. V. Bourque, secretary-treasurer of the association, one of the features of the coming convention will be an excursion to Mid-Continent natural gasoline plants, which will occupy the third day of the program schedule; plants in the active Seminole district will be visited this year.

On the evening of the second day will come the annual banquet and five separate program sessions are being planned, three for the first day and two for the second.

LARGE DRILLING PROGRAM

The Patterson-Brown interests of Anaconda and Spokane have launched a drilling program to develop 200,000,000 feet of natural gas in the Sweetgrass Hills area of Montana as an extension of a program instituted last fall.

7TH ANNUAL SAFETY MEET

At Butte, Montana, during the dates August 20, 21 and 22 of this year will be held the seventh annual International First-Aid and Mine-Rescue Contest, sponsored by the United States Bureau of Mines, Department of Commerce, in co-operation with the National Safety Council, The American Red Cross, and various industrial organizations.

LINE TO WILLISTON

Hope Engineering & Supply Company has contracted to lay a pipe line from Glendive, Mont., to Williston, N. D., and has opened offices in the latter community. Construction work will call for the employment of 475 men.

MAY SUPPLY THREE KANSAS CITIES FROM EMPIRE LINE

The United Power and Light Corporation of Abilene, Kansas, is considering the serving of natural gas to Abilene, Junction City and Manhattan through a hook-up with the Empire line bringing gas from the Panhandle. The line will be an extension of the line to Hutchinson, Kansas. These cities are now being served with manufactured gas.

SUPERBO
AUTOMATIC STORAGE WATER HEATERS

Manufactured in Los Angeles Since 1914

— — —

Superbo "Safety"

A Quality Product

FEATURING: — Dual Safety Control — Detachable Heating Unit—Safety Gas Shut-off.

No. 1—22 gallons . . . $ 97.50
No. 2—30 gallons . . . 125.00
No. 3—40 gallons . . . 150.00
No. 4—66 gallons . . . 250.00

— — —

Prices F. O. B. Factory

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Superbo Mfg. Co.

Los Angeles California

IT IS DIFFERENT
IT STARTS HOT

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The Economy Way is the

New Way

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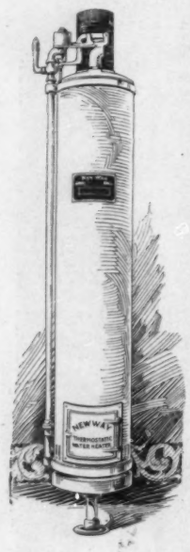

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In the New Way the pilot light heats the water in the coils,—always—there is no re-heating of the coils and heater every time the hot water faucet opens.

The New Way saves gas, water and time.

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Made and Guaranteed by

New Way Manufacturing Company, Inc.

894 FOLSOM STREET
SAN FRANCISCO

NATURAL GAS GASOLINE OPERATIONS

Compiled by E. T. Knudsen

Department of Commerce, Bureau of Mines, Division of Mineral Resources and Statistics

ONE hundred and thirty-five natural-gas gasoline plants with a daily indicated capacity of 1,416,800 Thousand Cubic Feet, report a recovery of 41,976,353 gallons of natural-gas gasoline from 26,778,762 thousand cubic feet of gas treated in January. This is a decrease of 239 barrels in Daily Average Production.

Utilization of natural-gas gasoline amounted to 1,128,843 barrels, an increase over December of 52,889 barrels. Daily average utilization of 36,414 barrels was 4,174 barrels more than Daily Average Production of 32,240 barrels.

Stocks of natural-gas gasoline at the end of January amounted to 531,041 barrels of which 31,228 barrels were reported by natural-gas gasoline plant operators and 499,813 barrels by refinery operators. This is a decrease of 68,175 barrels under December stocks. This stock figure of 531,041 barrels is approximately fourteen and one-half days supply at the current rate of consumption.

Production of gasoline during the month of January amounted to 5,152,254 barrels, a daily average of 166,202 barrels. This is a decrease in total production of 81,948 barrels or 1.57 per cent under December output and an increase of 243,257 barrels or 4.96 per cent over the output of January, 1927.

Of the total gasoline produced, 23,142 barrels were reported as finished gasoline produced by natural-gas gasoline plant operators. Production of gasoline from Cracking Processes increased in January to 617,770 barrels.

Stocks of gasoline show an increase of 214,889 barrels during January and at the end of the month amounted to 11,586,192 barrels. This stock figure includes 8 barrels of finished gasoline reported by natural-gas gasoline plant operators.

CALIFORNIA NATURAL GAS GASOLINE PRODUCTION, DISTRIBUTION AND STOCKS
JANUARY, 1928

PRODUCTION

Type of Plant	*Gas Treated M.C.F.*	*Natural-Gas Gasoline Produced (Gallons)*	*Gallons Recovery per M.C.F. Gas Treated*
Oil Absorption	16,824,594	26,974,569	1.603
Compressor	258,571	327,168	1.265
Combination Comp. and Oil Absorption	9,695,597	14,641,977	1.510
Drip	.....	32,639	.....
Totals	26,778,762	41,976,353	1.568

Finished Gasoline produced at plants—23,142 Bbls.

DISTRIBUTION

Stocks First of Month	.....		599,216	Bbl.
Production during Month	.....		999,437	"
Quantity Mixed with crude or unfinished oils	212,395	Bbl.	.....	
Used in Blending at Refineries	911,243	"	.....	
Stocks End of Month	531,041	"	.....	
Used at Plants, Shortage and Evaporation Losses	5,205	"	.....	
Balance	.....		61,231	"
	1,659,884	"	1,659,884	"

STOCKS

Natural-gas Gasoline held by Natural gas Gasoline Plant Operators	1,311,565	Gals. or	31,228	Bbl.
Natural-gas Gasoline held by Refiners	20,992,146	" "	499,813	"
Totals	22,303,711	" "	531,041	"

Finished Gasoline (Motor Fuel) held by Natural-gas Gasoline Plant Operators—8 Barrels.

MAKING 10,000 GALLONS

The Roxana Petroleum Corporation's gasoline plant in SE¼ of 19-19-4w, McCully field, of Logan county, Oklahoma, is running 4,250,000 feet of gas through its absorber and compressor and is turning out 10,000 gallons of gasoline daily. The town of Roxana, Okla., uses part of the residue gas and the remainder is used for drilling wells.

EMPIRE PLANT WORKING

A new gasoline plant four miles south of Wichita, Kansas, has been put into operation by the Empire Company as the newest of its 19 natural gasoline plants. The plant, which will treat natural gas now being delivered into Wichita from Pampa, Texas, through the Cities Service line, cost approximately $200,000. It is the oil absorption type, and is equipped to process approximately 75,000,000 cu. ft. of gas daily.

The natural gasoline will be stored in twelve 25,000 gallon storage tanks which have been provided from which it will go into the tank cars at the railroad loading rack.

SANTA MARIA REPORT

The annual report of the Santa Maria Gas Company, Santa Maria, California was released in February showing a total of 467,654 M. cubic feet of gas sent out in 1927 and a total of 5,489 domestic and industrial consumers. Operating revenue for the year ending December 31, 1927 was $307,759.79, other revenue $8,736.04, making a total of $316,495.83. Net profits for the period were $60,433.21 as compared with $41,645.90 for the year previous.

How Natural Gas Aids One Texas Nurseryman

(Continued from Page 27)

means of electric welding this pipe to flanges and bolting them to the engine and pump. In this operation of this unit, the engine is primed with about a teaspoonful of gasoline through the exhaust manifold preparatory to starting it. The auxiliary gas valve (13) and gas starting-and-control valve (1) are opened and the engine cranked up. The natural gas, after passing through the starting-and-control valve (1), passes on into the mixer (2) (see diagrammatic sketch) where air and gas are intimately mixed, and thence into the intake manifold (8). The butterfly valve (3) is an auxiliary air valve which permits closer adjustment of air and gas after the engine is started. As you will note, the intake (8) and exhaust (7) manifolds are simply inverted to their normal position, the exhaust going out overhead and conveyed to the outside of the shed by means of a 2-inch pipe. After the engine has started running, the clutch is thrown in by means of the clutch lever (9). If the pump does not pick up water at once, it is primed by means of the 2-inch by-pass around the 4-inch check valve (11), as shown. When the pump starts working, the water check valve (11) opens which, in turn, opens the gas valve (12) by means of a lever connection which is plainly shown in the photograph. Then the auxiliary gas valve (13) is closed, which causes all of the gas passing into the engine to come through the gas valve (12). This arrangement was adopted in order that the engine could be shut down at the nursery, without making a trip to the engine itself, which is located about a quarter of a mile away. As will be noted, this is accomplished by simply shutting off the water at the nursery, which closes the check valve (11), which, in turn, causes the gas valve (12) to shut off, thereby shutting down the engine. In the circulating water system, it will be noted that the water for this purpose comes off ahead of the check valve, passes into the engine through inlet (4) and comes out at (5), discharging into a pipe which carries the water back to the surface pond from which the irrigating water is pumped. No. (6) is the spark control.

The total cost of this equipment, including everything shown in the engine room view accompanying this article, and the cost of installing same, was around $800. The pump was operated for thirty days at from ten to twelve hours per day, and the gas bill, at a rate of 67½c per M. cu. ft., was $17.38. The fuel cost to pump 1,000 gallons of water was estimated to be less than one-half mill ($.0005-).

So we have another adaptation of natural gas added to the long list of uses which prove that *"if it is done with heat, you can do it better with gas."*

CAL. PET. GASOLINE LINE

A 10-mile three-inch pipe line from Santa Fe Springs to Los Alamitos has been completed by the California Petroleum Corporation, Los Angeles, Calif., the line to connect with the company's natural gasoline trunk line from Huntington Beach to Signal Hill.

GASOLINE ASSOCIATION HAS ANNUAL PROCEEDINGS

Proceedings of the California Natural Gasoline Association's annual Fall meeting are now available at $1.00 a copy, and may be had from Paul Barton, secretary of the organization, 701 South Palm Avenue, Alhambra, Calif.

TESTING LABORATORY A.G.A. APPROVED

Payne Furnace

Is Approved

BY

American Gas Association

AND

Consumer

Approved appliances are in demand in the modern home. Payne Furnaces have met the requirements of the A. G. A. Laboratory and their safety, durability and efficiency have been recognized by over thirty thousand consumers during fourteen years of Payne Service.

PAYNE FURNACE & SUPPLY CO. INC.

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Branch: 3810 Broadway, Oakland, Calif.
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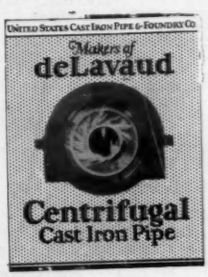

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OVER 8000 IN USE

FRANCIS TO RECEIVE GAS FROM SOUTHWEST COMPANY

The new Southwest Gas company pipe line from the north gas producing field near Ada, Okla., to the Allen field has been completed. This line has a capacity of 50,000,000 cubic feet daily and is now taking about 30,000,000 cubic feet from the connected wells. This gas is to be used in the city of Ada and by industries in the vicinity. The town of Francis also will be supplied with gas from the main pipe line connecting Ada with the Allen field.

ST. LOUIS LINE MAY BE UNDER WAY IN APRIL

A gas line from Richland Parish, Louisiana to St. Louis, Missouri, which line will also supply gas to the city of Memphis, Tenn., will be begun in April by the Moody and Seagraves interests in co-operation with other companies, according to February press reports. The line is expected to involve a cost of $20,000,000. The Palmer Corporation, which has extensive holdings in the Richland area, is understood to be interested in the project.

VOTE ON GRANDVIEW PLANT

The board of trustees of the city of Grandview, Missouri, has granted a franchise, subject to the approval of the city voters, to S. J. Madden and C. S. Shippey to operate a gas plant within the town. If the election carries, active construction work will be begun within six months.

GAS HOLDER SIGNING FOR AVIATION IS APPROVED

Assistant Secretary of War, F. Trubee Davison, in a recent communication to the American Gas Association expresses approval of the move towards marking of gas holders as an aid to aviation, and commends companies which are co-operating in this work.

NEW RATE SCHEDULE

A new schedule of gas rates has been announced by the United Power & Light Corporation, Salina, Kansas, stepping down the old rate so that the minimum charge per thousand feet will be 25c instead of 50c as formerly, this rate applying on all over one million feet used in any one month.

VOTE FAVORS GAS

Cititzens of Kingfisher, Okla., on February 7 voted a natural gas franchise to Black & Gould.

GAS LEASES CHANGE HANDS

Gas leases covering Grove Township, Kansas, have been purchased by the Southwestern Gas Company of Independence, from the M. T. C. Oil and Gas Company and the Elburn Oil Company of Colorado. Seven pipe lines extending from Montgomery County through the field, a compressor station, and other equipment were included in the deal.

CHICKASHA OFFICE OPENS

The new $65,000 home of the Southwestern Light and Power company was opened at Chickasha, Okla., on February 16, with an all day public reception.

GOOD WILL MEETING

The second good will convention of the public relations division, Oklahoma Utilities Association, was held at Lawton, Okla., February 23, Keith Clevenger, chairman of the division, presiding.

IOWA HOME ECONOMICS COURSE IN GAS, ELECTRIC APPLIANCES

The Iowa State College from March 19 to 24 will conduct a "Home Economics Short Course in Gas and Electric Equipment" at Ames, Iowa. The first of such courses, held last year, was widely attended by women in the sales departments of public utility companies in Iowa and neighboring states. Instruction in the use of gas appliances is being incorporated into the Short Course program for the first time this year.

Headquarters for the Course, which is under the auspices of the University's Home Economics Division, will be in Home Economics Hall, and laboratories, class rooms and other facilities will be available for the use of the students. Educational and general exhibits of household equipment and appliances will be on display throughout the week, furnished by co-operating manufacturing companies.

One feature of the course will be an address by A. Deane Dowell, Home Service Counsellor for the American Gas Association, on "Home Service and What It Means to a Utility Company." B. J. Mullaney, vice-president of the Peoples' Gas Light & Coke Company, Chicago, Ill., will be the principal speaker at a banquet on Friday evening, March 23rd, speaking on the subject "Know It—Then Tell It."

Further information relative to the Course may be had by addressing Mrs. Vivian Brashear, Home Economics Hall, Iowa State College, Ames, Iowa.

SAVE $900 PER MONTH ON GAS USE IN RAILWAY SHOPS

A fuel saving of $900 per month is accredited to the use of gas-fired boilers in the railway shops and roundhouse of the H. & T. C. Railway at the Ennis, Texas, Terminal. The boilers, of 250 H.P. capacity, were formerly fired with fuel oil. This installation is on the lines of the Municipal Gas Company of Dallas, Texas.

CHARTERED IN KANSAS

A charter to enter and operate in the state of Kansas has been granted to the Oklahoma Natural Gas Corporation of Tulsa, Okla. Kansas headquarters for the company have been established in Chanute. Under the grant given by the state the company is permitted to do all things incident to developing, transporting and distributing natural gas, and the sale of it to both domestic and industrial users.

GAS SHOVEL CONTRIBUTES TO SCIENTIFIC LORE

At Golconda, Ill., a gas company's steam shovel recently dug up teeth, pieces of tusks, and other structural parts of a northern hairy mammoth, somewhat strengthening a Springfield museum calculation that elephants roamed Kansas 200,000 years ago, and Illinois 100,000 years ago.

ASK GARDEN CITY FRANHCISE

Application for a franchise to pipe gas into Garden City, Kansas from wells near Liberal, Kansas, has been made by the firm of Moore and Wilson, and Ray Millman of Liberal.

L. B. REED ON WEST COAST

L. B. Reed, vice-president of the Gas & Electric Heater Company, La Porte, Indiana, paid the Pacific Coast a visit during February.

Natural Gas Presents Big By-Product Field

PEAKING at Chicago before the natural gasoline group at the American Petroleum Institute's convention in December, on the topic "Natural Gasoline as a Chemical Material", Emby Kaye of the Skelly Oil Company, gave an able review of the by-product possibilities in the natural gas and natural gasoline field. A portion of his paper, treating principally of by-products from natural gas which has already been treated for natural gasoline extraction, is given below:

CONTROLLED CHLORINATION

"During recent years considerable experimental work has been done looking to the manufacture of by-products from natural gas by means of controlled chlorination. Several such processes have been evolved, each differing only in minor details of control or catalyst[1]. The most illustrative method consists in the passing of a natural gas and chlorine mixture, preheated to between 200 and 400° C., over coke or activated carbon that has been treated with a zinc chloride solution. The products thus recovered are nearly 100 per cent of the theoretically possible yield, and only a small amount of gas is passed out of the system. The products formed by the reaction of methane with chlorine are: methyl chloride, methylene chloride, chloroform, carbon tetrachloride, and hydrochloric acid.

"Since the reactions are exothermic, provisions for regulating the extraction of heat from the reacting zone must be provided or the reaction chamber will reach such a high temperature that the reactions will take place with explosive violence with the formation of free carbon. When the reaction takes place with explosive violence, no substitution products of methane and chlorine are formed.

"The reactions of chlorine with methane are as follows:

(1) For the formation of methyl chloride: CH_4 plus CL_2 equals CH_3CL plus HCL
(2) For the formation of methylene chloride: CH_4 plus 2 CL_2 equals CH_2CL_2 plus 2 HCL
(3) For the formation of Chloroform: CH_4 plus 3 CL_2 equals CH CL_3 plus 3 HCL
(4) For the formation of carbon tetrachloride: CH_4 plus 4 CL_2 equals CCL_4 plus 4 HCL
(5) For the deposition of free carbon: CH_4 plus 2 CL_2 equals C plus 4 HCL

" . . . . the probable future of the chlorination of various natural gas constituents lies in controlling the conditions of chlorination so that a large percentage of methyl chloride be formed, and then effecting hydrolysis of the methyl chloride to form methyl alcohol. This process should provide an economical supply of the important industrial solvent, methyl alcohol. That this field is not saturated is attested by the many inquiries that come to us day by day.

"A second series of possible processes for the utilization of natural gas has been introduced in the past two years[2]. These processes are the reverse of 'cracking,' . . . . as they have been developed for 'constructive conversion' of hydrocarbon gases into liquid

1. Chlorination of Natural Gas, Technical Paper 255, Bureau of Mines.

2. British Patent 255,493 of July 18, 1925. Also British Patent 255,829, and U. S. Patent 1,571,994.

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Fluor cooling towers are built to last a lifetime. If the plant served becomes obsolete or unprofitable, the Fluor tower can be easily unbolted and shipped to a new location.

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Cochrane feed water softeners (hot and cold processes)
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hydrocarbons. The procedure in these processes consists of preheating gases containing methane and other hydrocarbon gases to between 400 and 950° C, then passing them, under pressure, over catalytic agents, such as zinc chloride, active carbon, elementary metals, or suitable mixtures of metal oxides. The resultant products are cooled and the liquids condensed and separated from the gaseous constituents. The gaseous products from these processes contain ethylene, propylene, and butylene, which may be absorbed by scrubbing the gases with concentrated sulphuric acid[3] [4]. The alkyl acid esters thus formed may be hydrolized by dilution with water; and the alcohols thus formed may be removed by distillation. The alcohols may be separated and further purified by subsequent distillations. The alcohols thus formed are: ethyl alcohol, isopropyl alcohol, secondary butyl alcohol, and secondary amyl alcohol. The gases that are not absorbed in the sulphuric acid tower are transported to the burners of the preheater, where they are utilized as fuel to preheat the fresh hydrocarbon gases entering the system.

"The liquid constituents obtained from the process are high in clefin content and several different organization units are investigating the possibilities of developing economic processes to convert them into alcohols, glycols, aldehydes, ketones, and acids. Clefin hydrocarbons of high molecular weight might be heated with air in the presence of mercuric oxide to form fatty acids of commercial importance[5]. The economic aspect of the manufacture of any of the above possible series of compounds can only be determined by extensive experimentation. However, the liquid fractions could always be fractionated to form motor fuels. There is also a possibility of the recovery of benzol and tuluol from the condensed liquids."

3. Chemical and Metallurgical Engineering Volume 33, No. 7, of July, 1926.

4. Ethylene has been used with considerable success in ripening fruit. The advantages of shipping green fruit to market and artificially ripening it upon arrival, with the diminution of losses due to decay, are manifest.

5. Organic Chemistry. J. F. Norris—1922.

CALL SECOND ANNUAL CENTRAL STATES SAFETY CONGRESS

The second annual Central States Safety Congress will be held at Kansas City, April 23, 24, and 25. The conference of a year ago attracted more than 1200 persons. This year's conference is expected to draw an unusually large western attendance because the next annual congress of the National Safety Council has been slated for New York City.

PHILLIP MUELLER DIES

Phillip Mueller of the Mueller Company, Decatur, Illinois, following a stroke of apoplexy on January 19, died the morning of January 23 at his home in Decatur. The deceased wsa born October 16, 1856. As superintendent of the Mueller factory, and first vice-president of the company, he was widely known in the plumbing and gas-fitting industries.

PREFERRED LIST GROWS

Holders of preferred stock of the Empire Gas & Fuel Company now total 17,217 according to a report released from the Company in February. This represents an increase of some 300 per cent during the two-year period, January 1st, 1926 to January 1st, 1928.

INDUSTRIAL CONTRACT

According to T. J. Strickler, general manager of the Kansas City Gas Company, Kansas City, Mo., the Standard Oil Company of Indiana on Monday, February 13 signed a contract with that utility for a minimum of 6,000,000 cubic feet of gas daily and a maximum of 12,000,000 cubic feet daily for use in its refineries at Sugar Creek, Mo., representing the largest industrial gas contract to date by that gas utility. On February 15th 20,000 feet of 24-inch pipe was ordered by the gas company, construction on the line to the refineries to start early in March.

CAMPBELL APPOINTS STEARNS ROGER MFG. CO.

J. A. Campbell, natural gas engineer of Long Beach, California, has appointed the Stearns-Roger Manufacturing Company of Denver, Colorado, as Mid-Continent representative. The Denver firm, which will have charge of installation work for Campbell lines, has opened offices at 938 Kennedy Building, Tulsa, Oklahoma. Mr. Campbell will have general supervision of installations, making frequent trips to Mid-Continent fields in that connection.

PUBLIC HEARINGS OF CALIFORNIA TAX COMMISSION

The California Tax Commission will hold a series of public hearings commencing Thursday, March 1st at Sacramento, to which individuals and representatives of industries and organizations are invited to appear to present information, criticism or suggestions bearing upon the California tax system. Hearings will be held commencing March 6th in San Francisco, March 12 in Fresno, and March 13 in Los Angeles.

RAYMOND APPOINTED

Larry Raymond, for the past year with the Southern Counties Gas Company, Los Angeles, has been named advertising and publicity agent for that utility.

OKLAHOMA METER COURSE TO CONVENE MAY 24

Gas metermen from five states will assemble at the University of Oklahoma, Norman, Oklahoma, May 24 to 26 for the fifth annual Metermen's Short Course, with some 350 workers from Kansas, Louisiana, Arkansas, Texas and Oklahoma expected. The short courses at Norman began in 1922 and the school has grown rapidly since that time under the auspices of the University, the Oklahoma Utilities Association, leading gas utilities and other organizations.

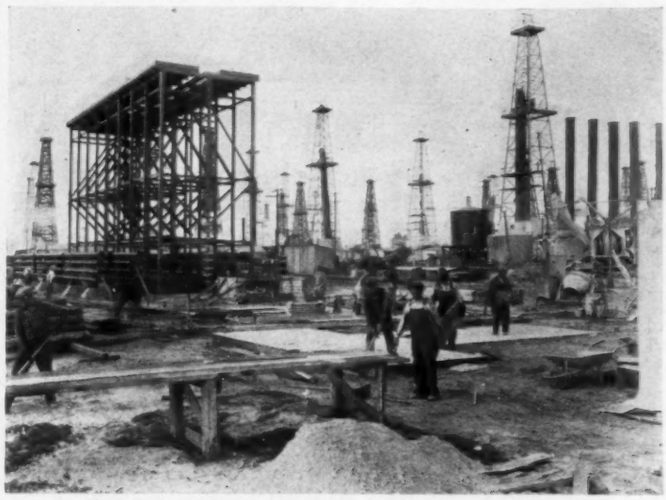
12-INCH LINE NEARS FINISH

Allen Pipe Line Company's 12-inch gas line being laid from the Allen field, Pontotoc county, Oklahoma, to the town of Ada, Oklahoma, which will be supplied with natural gas for domestic and industrial consumption is nearing completion. Other towns are expected to be supplied later and excess gas produced from the field will be stored in old wells until facilities are completed for moving the gas for consumption. The line is expected to begin taking 25,000,000 cubic feet of gas in the near future.

SELLS ELECTRIC PROPERTIES

The electric properties of the Bartlesville Gas and Electric Company, in Bartlesville, Oklahoma have been purchased by the Insull interests, according to press report.

Billions of Bubbles



Construction scene during erection of 25,000-gallon Campbell Plant at Alamitos Heights, Long Beach, California

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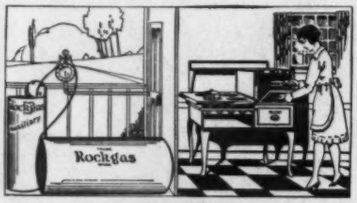

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APPLICATION TO PURCHASE TWO UTILITIES

Application has been made with the Missouri state public service commission by the National Utilities Company, Brookfield, Missouri, for permission to purchase the Kirksville Gas Heating & Electric Company and the Brookfield Gas, Electric & Heating Company. One million shares of captial stock of no-por value and $300,000 of six per cent 10-year bonds would be issued to finance the transaction.

EMPIRE USING OIL LINE FOR RESIDUE GAS

The Natural Gasoline Division of the Empire Companies is to deliver residue gas from its plants in Greenwood county to El Dorado through a four-inch pipe line from Teter to Sallyards, Kan., which was formerly used by the oil pipe line division. The line connects at El Dorado with the Empire's gas distribution system.

FALLS CITY IS GAS PROSPECT

According to February report an attempt is being made by the chamber of commerce of Falls City, Nebraska, to get natural gas piped to that community from Atchison. It is understood that the pipe line, if the project is undertaken, would pass through Horton and Hiawatha, bringing gas to both of those cities.

CRESCENT SERVICE BEGINS

Twelve miles of 3½ inch line are now serving 50 consumers in Crescent, Oklahoma, with natural gas which comes from a well near the community. Rates are $1.50 first M, 70c. next 10 M, 50c. next 25 M, 40c. next 64 M, and 25c. all over 100 M. Gas is supplied by the Oklahoma Central Gas Company, of which A. J. McMahon, Oklahoma City, is president and E. A. Good is local manager.

HUTCHINSON LINE FINISHED

The United Power & Light Corporation of Hutchinson, Kansas, is now getting natural gas through a pipe line which connects with the McPherson-Hutchinson gas line laid by the Kansas Pipe Line Company Gas from the new mains was turned into the line the middle of February.

AUTOMATIC RATE DROP

As a result of an automatic gas rate adjustment reflecting a decrease in the cost of fuel oil new rates have gone into effect on the lines of the Pacific Gas and Electric Company. It is estimated that consumers will benefit to the extent of approximately $300,000 a year in lowered gas rates.

GAS BROUGHT IN NEAR NEW ORLEANS BY GULF REFINING

A gas well recently brought into production near McElroy, Louisiana, in Ascension Parish, by the Gulf Refining Company, has caused the prediction to be made that this source may be used to supply New Orleans, which is fifty miles away, with natural gas. Other wells will be developed in this field.

25-YEAR FRANCHISE

C. N. Haskell has received a 25-year franchise to serve gas to Fort Gibson, Okla. The city election at which the franchise was ratified was held on February 8.

BEGIN CARTHAGE SERVICE

Natural gas was turned on in the city of Carthage, Panola County, Texas, by the Dixie Gas & Fuel Company on February 15.

Fire Records Valuable

FROM W. E. Richmond, first aid and plant employment officer of the San Diego Consolidated Gas and Electric Company, *Western Gas* recently received the following caution to pass on to our readers:

FIRES

"Under the best conditions and circumstances affecting those conditions, there occurs in most plants about every so often a fire of some kind. These fires are 'usual' and 'unusual' in character. At times the 'usual' kind of fire occurs under unusual circumstances—in an unaccountable place; for no apparent reason; at a time when it is least expected, etc. The 'usual' fire is thought little about. The 'unusual' fire creates quite a commotion and is looked into carefully. *Every time* a fire extinguisher is used about the plant, a written report should be made covering the time, place, cause of fire if known, and measures for preventing a recurrence should, if possible, be suggested.

"Over a period of years these data become valuable."

POTTER OFF FOR EAST

Clyde H. Potter, general commercial agent of the Southern Counties Gas Company, leaves Los Angeles on March 20 for a six-weeks tour throughout the Middle West and East, during which he will inspect appliance factories and visit commercial departments of a number of leading gas companies.

C. H. BEACH HAS FRANCHISE IN MOUNT PLEASANT, TEX.

The City Council of Mount Pleasant, Texas, has granted a gas franchise to G. H. Beach of Wichita, Kansas. According to the franchise, gas is to be delievered within six months.

CORROSION RESEARCH FUND

As a fund for investigation of corrosion problems, executive officers of the American Petroleum Institute have set aside the sum of $20,000.

SEABOARD STATES LEAD IN CONSUMPTION OF FUEL OIL

The consumption of fuel oil in this country is largely concentrated in the states located directly on the seacoasts, says the United States Bureau of Mines, Department of Commerce, following a survey of gas oil and fuel oil distribution during 1926, conducted in cooperation with the American Petroleum Institute. Four-fifths of the national domestic deliveries of these oils were made in the states bordering the Pacific and Atlantic oceans and the Gulf of Mexico. Three states, California, Texas and Louisiana, accounted for 43 per cent of the national domestic distribution. The survey covered a distribution of 340,481,000 barrels, amounting to approximately 97 per cent of the oil marketed.

Among domestic consumers, the railroads and oil refineries alone consumed as fuel nearly one half of the total oil marketed. Railroads lead in consumption, having received 74,704,000 barrels, or 29 per cent; oil companies consumed 48,846,000 barrels or 19 per cent, as fuel at the refineries or in the field; gas and electric power plants received 33,023,000 barrels, or 13 per cent; smelters, mines, steel mills and foundries received 25,245,000 barrels, or ten per cent; and other manufacturing plants, 45,484,000 barrels, or 18 per cent. Commercial and domestic heating accounted for 17,070,000 barrels, or seven per cent.

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KEY SPECIAL PIPE JOINT COMPOUND will effectively seal screw thread and gasket joints for such service as Gas, Water, Steam, Compressed Air, etc.

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KEY SPECIAL PIPE COMPOUND is not a quick hardening cement but a plastic lubricant and filler that will seal the most obst nate joint with ease.

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National City San Diego California

STATE CONVENTION

The 1928 State Convention of the Missouri Association of Public Utilities will be held at Jefferson City, Mo., on the dates of April 26, 27 and 28, by announcement of J. B. Sheridan, Director of the Missouri Committee on Public Utility Information. J. E. Hillemeyer is chairman of the program committee for the 1928 convention.

BUYS OKLAHOMA PROPERTIES

Central States Light and Power Corporation has purchased the Holdenville Gas Company, Okemah Gas Company and Wetumka Gas Company, all Oklahoma properties.

HOT-N-KOLD OPENS BURLINGAME BRANCH STORE

Another Hot-N-Kold branch shop has been opened in northern California, at 1319 Burlingame Avenue, Burlingame. . The store was formerly that of the Larke Appliance Company, and Larke himself has joined the staff of the Hot-N-Kold Shop, in charge of gas sales. A. A. Anderson, formerly the Kelvinator agent in that territory, has also associated himself with the new shop, as branch manager. Mr. Anderson will also take personal supervision of the electric sales.

200,000 GALLON PRODUCTION FOR NATURAL GASOLINE DEPT.

Average daily production of the Natural Gasoline Division of Empire Oil & Refining Company and affiliated organizations now totals 200,000 gallons daily.

BERT SCOTT MANAGER OF RETAIL SALES

Bert Scott, former owner of the Scott Heating & Manufacturing Company of Los Angeles, has dissolved that enterprise and is now associated with the Payne Furnace & Supply Company in charge of retail sales in Los Angeles and vicinity.

COMPANY NAME CHANGED

The Sedan, Kansas, Gas & Water Company has changed its name to the Sedan Gas Company, following recent renewal of its state charter.

SPRAGUE BULLETIN NO. 11

Sprague Meter Company of Bridgeport, Conn. has issued its bulletin No. 11 in the 1928 edition describing Sprague Service Regulators for manufactured and natural gas.

COAST COUNTIES PRESIDENT'S PERSONNEL RATING POLICY

A system whereby the president of the company is accorded the opportunity of conveying a personal message to all of the employees earning advancement is used by S. Waldo Coleman, president of the Coast Counties Gas and Electric Company, San Francisco. Every job is scaled as to its maximum and minimum wage, and with various gradations between these two limits. A new employee's status is grade C. At the end of six months and on recommendation of his superior, he may be advanced to a B rating with an increase in salary; thence at the end of another six-month period to an A rating. Before an employee is given the A rating, however, his record is submitted to President Coleman. If the rating is given, along with it and another increase in salary comes a letter from the president, congratulating the employee upon his advancement. Other and more advanced ratings are set up for six months after grade A, one year after grade A, and so on.

An Advertising "Wrinkle"

(Continued from Page 25)

advertising department consists of one person, we have grounds to believe that you can not make it every time. And we do not like to call too often upon the newspaper art department for original drawings. So we whirl through the mat service proof sheets to see what we can find. It is surprising, the unusual and apparently unrelated subjects that make grist for your mill. A ship in full sail can serve a gas company, at one time or another. You do not have to confine yourself to dwellings, interiors, kitchens, foods, and so forth, that offer obvious combinations.

A couple of lanky lads on a tennis court have been known to point the moral of a paragraph on a certain care-free leisure a gas-fired community enjoys. Flowers popping up around a garden walk can illustrate (believe it, or not) an incinerator advertisement. (The vegetable and mineral ash, you remember, is excellent fertilizer for gardens and fruit trees.) Wild geese in flight (originally designed to sell buckshot) give a brisk tone to a fall message on new gas equipment. And there are a dozen ways to use children. Sometimes you find a good mat drawing that is too large for your purpose, but this does not perturb you. You simply have the newspaper engraving room make a cut of it in the proper size, for a modest charge.

Some day we may get so rich and professional that we shall laugh at mat services, and call them hand-me-downs. In fact, we smile a trifle even now, and call them suburban art. But just the same, we benefit from these pink cardboard molds. Nobody claims they are all-sufficient or fool-proof. They offer a short cut, but not so short as some might think. It takes ingenuity and faithful care to keep them from showing they are ready-made.

In the newer gas towns, especially, it seems to me this inexpensive method of illustration could be of great value. They are often brand new companies, on modest appropriations, and with little advertising experience. Eager to have everybody "know their voice," they promptly start newspaper advertising, writing sincere messages which a linotype operator taps out into print. Well and good. But who is going to read this print? Who is going to stop what he is doing to pore over a message from the Gas Company, set solid, plain black and white, when he can skip to one side and look at smart roadsters or pretty ladies in other advertisements? With an intelligent, painstaking use of type, white space and a pink mat, these young companies can dress their messages well. Their neighbors will regard them as up-to-date, friendly people, and not as a gas monopoly buying space to pacify the newspapers.

DEATH TAKES R. B. HAYWARD

Ralph B. Hayward, for the past 15 years associated with the Connelly Iron Sponge & Governor Company, died Januar 27 at San Diego, California. The deceased is survived by his father, Sterling F. Haward, two brothers, Harold A. and Sterling P. Hayward, who are respectively president, secretary and vice-president of Connelly Iron Sponge & Governor Company. Two sisters also survive Mr. Hayward.

CEMENT PLANT EXPECTED TO USE 5,000,000 CU. FT. DAILY

When the plant of the Colorado-Portland Cement Company, which was completed in January. goes on its schedule of exclusive use of natural gas for fuel, it is expected to consume 5,000,000 cubic feet daily.

- - - When you consider - - -

changing over from solid to pneumatic truck tire equipment, remember that Goodyear has developed a complete line of pneumatic truck tires for every kind of truck operation, each particular type designed for speed, load protection, traction and long, economical wear.

Remember, too, that the long experience of Truck Tires Service in solving truck tire problems enables us to offer expert counsel and advice as to proper type pneumatics, and that we have the facilities to handle every detail of the complete changeover job.

"A Tire for Every Need"

Truck Tire Service Co.

LONG BEACH
220 East Anaheim Street
622-79

HOLLYWOOD
6523 Santa Monica Blvd.
HOllywood 5524

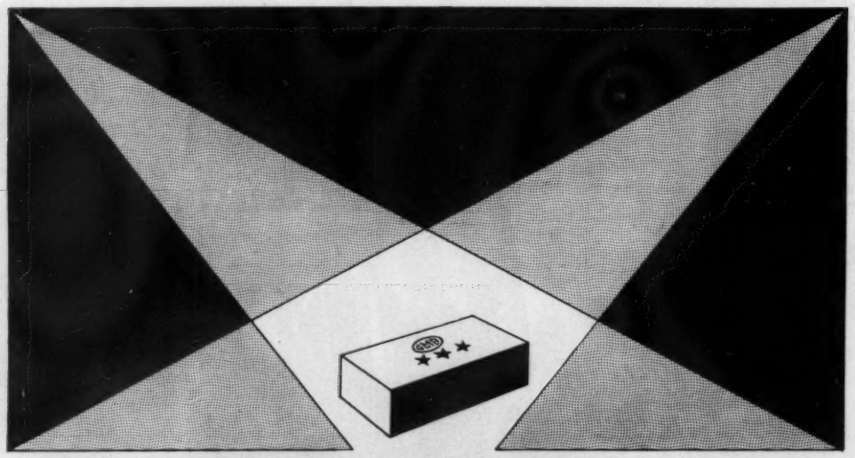
LOS ANGELES
1244 East Eighth Street
TRinity 6565

C. B. Babcock Company

"We Serve"

135 Bluxome Street
San Francisco, California

2132 Atlantic Street
Los Angeles, California



FIRE BRICK

LININGS, CHECKERS and BOILER SETTINGS are carried in stock for quick shipment. If special or hand-made shapes are required, our plant is especially equipped to make them.

GLADDING, Mc BEAN & CO.

SAN FRANCISCO LOS ANGELES
PORTLAND SEATTLE

420

JOHNSON

Direct Jet Principle Attains Even Greater Efficiency and Economy!

The new Johnson Venturi Mixers and Tubes are now available in any size for use on gas burners of all types. This new Johnson invention has released the Johnson Direct Jet Principle to the limit of efficiency and economy. The gas and air adjustments are positive and accurate. A greater supply of controlled air is admitted to the Venturi Mixing Tube and this tube creates pressure with the result that perfect combustion is attained. Write for full details of this interesting and important achievement.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. Babcock Co.
135 Bluxome Street San Francisco, California

What *the* Blue Star Means

(Continued from Page 20)

unsafe appliances up to the proper standards, even though the effect was to reduce the elaborateness of construction of the others than to have continued as in the past? However, I can not see that this condition will ever be realized. Although the Ford and Chevrolet have brought out good low priced cars, are there not as many Packards and Pierce Arrows being bought at the present time as formerly? The fact that there are cheap appliances on the market that are safe and efficient should not deter the person who can afford it from purchasing a better appliance.

That the Laboratory has raised the standards of performance in a large number of cases is conclusively proved by the fact that out of the hundreds of appliances tested, only four or five have been approved without changes being required.

The Laboratory can not regulate the installation of appliances, and the fact that a few manufacturers may have replaced a number of Blue Star appliances which were not giving satisfactory service with a like number of their own appliances of a larger size which did give satisfactory service results, does not condemn Blue Star, but rather reflects on the dealer who sold appliances too small to do the work required of them.

Plans for grading approved appliances have been discussed at various times. Procedures of this kind, however, have always met with failure in other industries, for they state in fact that one manufacturer's product is better than the others. Further, I question seriously if committee men could ever agree on a set of comparative standards. The more complicated a plan becomes in its operation, the greater are its possibilities of failure. In the last analysis, it seems that we are going far enough. Our present committee policies call for strengthening the requirements from year to year and the Laboratory will insist on a better class of workmanship during each succeeding annual inspection.

The Blue Star of Approval, standing as it does for high standards of safety and efficiency and for reasonable concepts of substantiality and durability, will in the end be the mark the buying public will look for and demand on all gas burning appliances. This condition, however, can only be brought about by educating not only our own people but the dealers and the buying public as well, to the true meaning of the Blue Star.

This Blue Star Plan

(Continued from Page 21)

comfort in the use of gas, and fitted with approved appliances."

The standard must not be set so high as to be out of reach. Nor should it be set so low as to lose its entire value.

The Association does not, of course, suggest detailed plans for each locality until after a study of the local conditions. The first step is for each company to draw up minimum specifications for its own particular locality, designating piping, flues, vents and the number of appliances as well as the standard of construction it will require in the house to entitle it to a Blue Star Certificate. These standards are then submitted to the Association for approval, and with this standard approved the work as outlined heretofore is taken up.

Personally, I believe we are now at the point where all specifications for Blue Star Homes, in addition to proper piping, etc. should contain four major gas burning appliances, such as house heating, range, water

heating and one other appliance, such as incineration, refrigeration, space heating, etc.

The only place these specifications would not work would be in a few companies who are not pushing house heating, due to rates or other conditions, and in the South where central househeating is not used to any extent. Here specifications would have to be set up without house heating.

But let me aagain emphasize, a Blue Star Home is a home equipped with approved appliances, properly piped and built for satisfactory gas service and using gas for all major operations. It is not one or the other but all these things ocmbined.

Now we come down to the Model Home. There is no way in the world our campaign can be started so well, no way we can present the picture of the Blue Star Home or get so much publicity as through the use of the Model Home idea—no way we can popularize the Blue Star Home quicker than by exhibition homes under the name of Blue Star.

Last year we had twenty-four homes exhibited. This year if all promised go through, we will have thirty-five. We have had entire sections of newspapers devoted to this Blue Star Plan. Several realty companies have gotten out special books entitled "The Blue Star Home." The best of these is by the Beverly Realty & Investment Company of Chicago. Get a copy. It tells more about this home than any other book printed.

But let me say one thing in the way of caution. If you are going to have just a Model Home, no matter how good, and not follow up the work started there by a close contact with architects and builders and consolidate your gains, the whole matter might better be let alone. The good start will soon die unless followed up vigorously.

This plan can also be used in homes being remodeled or refitted, if they are of right standard.

The plan is also designed to correct the habit of the public of buying household gas equipment on the piece-by-piece basis.

No home-builder today buys his plumbing and heating equipment in this way, and there is no reason why he should not also purchase gas service as a complete unit.

The plan offers a profit to every trade element involved, in return for their support of the movement.

So, I say to you, set your standards, develop your architect and builder contacts, talk up this Blue Star Home and, instead of being something of a mystery, it will be a practical, workable sales plan and will bring you increased business.

ASKS HETTINGER FRANCHISE

W. J. Johnson, Marmarth, N. D., has applied for a franchise to serve Hettinger, N. D., with natural gas for heating and lighting purposes, the gas to be secured from fields in western Bowman County or Fallon County, Montana Pipe line construction will be commenced before August 1, 1928, and the city's distribution system completed within two years, if the franchise is granted.

CHANGES ANNOUNCED FOR THREE DOHERTY SECURITY OFFICERS

Several changes have been made in the managership of three midwestern security offices of Henry L. Doherty & Company, as announced on February 3. Gale Richmond, Tulsa manager, has succeeded E. A. King at St. Joseph, Mo., Mr. King has been transferred to Dallas, replacing H. E. Norton, who has left the company. Wesley D. Martin now fills Mr. Richmond's position at Tulsa, Okla.

The Reliance Balanced Valve Regulator

An addition to the Reliance line, which for positive lockup, close regulation, large capacity, low cost of upkeep and accessibility will further increase the prestige of the Reliance.

Reliance Manufacturing Company

1000 Meridian Street **Alhambra, California**

WESTERN GAS
626 South Spring Street,
Los Angeles, California .....192.....

Starting with the next monthly issue, you may send WESTERN GAS to the undersigned. Upon receipt of invoice, remittance will be sent to cover (1 year $2.00) or (3 years $5.00).

Name ..... *Title* .....

Company .....

Address .....

City and State .....

Please Check

[ ] GAS COMPANY [ ] GAS APPLIANCES
[ ] NATURAL GASOLINE CO. [ ] MISCELLANEOUS

Subscription: 1 Year, $2.00; 3 Years, $5.00, in Advance

A WESTERN GUIDE to INDUSTRIAL PURCHASING

Readers interested in any articles not listed in these pages are cordially invited to advise *Western Gas* of their wants and every effort will be made to furnish a list of the proper manufacturers. Addresses of companies listed on these pages may be found by consulting their advertisements in this issue.

Absorption and Compression Plant Equipment
Baker Iron Works.
C. F. Braun & Co.
J. A. Campbell.
Chaplin-Fulton Mfg. Co.
Fluor Construction Co.
Jackson Engr. & Equip. Co.
Jensen Instrument Co.
The E. A. Key Company
Southwestern Engineering Corp.
Western Pipe & Steel Co.

Absorption Towers
Baker Iron Works.
C. F. Braun & Co.
J. A. Campbell.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Adjustable Plugs
Lattimer-Stevens Co.
Western Pipe & Steel Co.

Agitators
Baker Iron Works.
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Aluminum Bronze Powder for Paint
Fort Worth Laboratories.
W. P. Fuller & Co.
Hill, Hubbell & Co.

Analyzers
C. F Braun & Co.
A. R. Maas, Laboratories.
Smith-Emery Co.

Annealers (Bar, Blank, Strip)
Pacific Meter Works.

Anti-Fluctuators
Pacific Meter Works.

Apparatus, Experimental Gas
The Bartlett Hayward Co.
Pacific Meter Works.

Appraisals and Valuations
Charles R. Collins.
Smith-Emery Co.

Automobile Tires
Truck Tire Service Co.

Bags, Gas Main
C. B. Babcock Co.
Connelly Iron Sponge & Governor Co.
Fort Worth Laboratories.
Mueller Co.
Safety Gas Main Stopper Co.
Semet-Solvay Engr. Corpn.

Barometers
Jensen Instrument Co.
Westcott & Greis, Inc.

Bench Iron Work
The Bartlett Hayward Co.
General Gas Light Co.

Blast Gates
Semet-Solvay Engr. Corpn.

Blocks and Tiles, Fire Clay
Gladding, McBean & Co.
Semet-Solvay Engr. Corpn.
Stockton Fire Brick Co.

Blowers and Boosters
Ingersoll-Rand Co.

Boiler—Brickwork
J. T. Thorpe & Son, Inc.

Boiler Equipment
E. A. Key Co.

Boiler Maker's Tools
E. A. Key Co.

Boilers, Gas-Fired
C. B. Babcock Co.
Baker Iron Works.

Boiler Settings, Pipe and Boiler Insulation
Pioneer Paper Company.
J. T. Thorpe & Son, Inc.

Boilers, Waste Heat
Baker Iron Works.
The Bartlett Hayward Co.

Boilers, Water Tube
Baker Iron Works.
Southwestern Engineering Corp.
Western Pipe & Steel Co.

Boxes
Baker Iron Works.
Semet-Solvay Engr. Corpn.

Brass (rods, sheets, tubes, wire)
Mueller Co.

Breakers
Ingersoll-Rand Co.

Breeching (Boiler and Stack)
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Brick, Firebrick
Gladding, McBean & Co.
Semet-Solvay Engr. Corpn.
Stockton Fire Brick Co.

Brick, Firebrick—Installation
J. T. Thorpe & Son, Inc.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Buildings, Steel
Baker Iron Works.
Western Pipe & Steel Co.

Bunkers, Steel and Concrete
The Bartlett Hayward Co.
Western Pipe & Steel Co.

Burners, High Pressure
Lee B. Mettler.
Rotary Manufacturing Co.

Burners, Low Pressure
C. B. Babcock Co.
The Bartlett Hayward Co.
General Gas Light Co.
Johnson Gas Appliance Co.
Lee B. Mettler.
Payne Furnace & Supply Co.
Rotary Manufacturing Co.
Standard Gas Equipment Corp.

Burners—Oil
Rotary Manufacturing Co.

By-product Recovery Apparatus
The Bartlett Hayward Co.
Oliver Continuous Filter Co.
Semet-Solvay Engr. Corpn.

Calorimeter Accessories
Fort Worth Laboratories.
Pacific Meter Works.

Calorimeters
Pacific Meter Works.

Cases, Meter
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Casinghead, Gas Meters
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.

Casing and Tubing (steel)
Semet-Solvay Engr. Corpn.
South Chester Tube Co.

Casing—Iron
South Chester Tube Company

Cast Iron Pipe
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Castings
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Cement
Stockton Fire Brick Co.

Cement, High Temperature
Stockton Fire Brick Co.

Cement—Plastic
Pioneer Paper Company.

Centrifugal Pipe
United States Cast Iron Pipe and Foundry Co.

Charging Machines (retort, etc.)
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.

Checker Brick
Gladding, McBean & Co.
Semet-Solvay Engr. Corpn.
Stockton Fire Brick Co.

Chemical and Gas Testing Apparatus
Fort Worth Laboratories.
Pacific Meter Works.
Stauffer Chemical Co.
Westcott & Greis, Inc.

Chemists, Analytical
Fort Worth Laboratories.
A. R. Maas, Laboratories.
Smith-Emery Co.

Chimneys, Radial Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.

Chimneys, Radial Brick Installation
J. T. Thorpe & Son, Inc.

Chutes (coal, coke, ash)
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Clamps and Sleeves, Pipe
Mueller Co.

Clamps, Service
Mueller Co.

Cleaners, Service
C. B. Babcock Co.
Pacific Meter Works.

Coal Gas Plants
Charles R. Collins.
Semet-Solvay Engr. Corpn.
The Bartlett Hayward Co.

Coal Tar Products and Chemicals
W. P. Fuller & Co.
A. R. Maas, Laboratories.

Cocks
C. B. Babcock Co.
Johnson Gas Appliance Co.
Lattimer-Stevens Co.
Merco Nordstrom Valve Co.
Mueller Co.
Geo. D. Roper Corporation.

Collectors, Dust
Western Pipe & Steel Co.
Semet-Solvay Engr. Corpn.

Compressors, Air
The C. & G. Cooper Co.
Ingersoll-Rand Co.
Oliver Continuous Filter Co.

Compressors, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, High Pressure
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, Portable
Ingersoll-Rand Co.

Condensers
Baker Iron Works.
The Bartlett Hayward Co.
C. F. Braun & Co.
Ingersoll-Rand Co.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.

Condenser Boxes
Baker Iron Works.

Condenser Tubes
Fort Worth Laboratories.
Semet-Solvay Engr. Corpn.

Controllers
Jensen Instrument Co.
The Foxboro Co., Inc.

Controls, Air and Steam
Jensen Instrument Co.
The Bartlett Hayward Co.
C. F. Braun & Co.
The Foxboro Co., Inc.

Cooling Systems
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.

Cooling Towers
C. F. Braun & Co.
J. A. Campbell
Fluor Construction Co.
J. B. Gill Corporation.
Jackson Engr. & Equip. Co.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.

Counters, Revolution
Fort Worth Laboratories.
Jensen Instrument Co.

Couplings
Pittsburgh Equitable Meter Co
The Bartlett Hayward Co.

Coverings (Tank, Boiler, Cold and Steam Pipe)
Pioneer Paper Company.

Cubic Foot Bottle
Pacific Meter Works.

Cutters, Pavement
Ingersoll-Rand Co.

Cutters, Pavement
Ingersoll-Rand Co.

Cylinders, Compressor
The C. & G. Cooper Co.
Semet-Solvay Engr. Corpn.

Dephlegmaters
C. F. Braun & Co.
J. A. Campbell
Southwestern Engineering Corp.
Semet-Solvey Engr. Corpn.
Western Pipe & Steel Co.

Diaphragms, Meter
Chaplin-Fulton Mfg. Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Diggers, Clay
Ingersoll-Rand Co.

Discharging Machines (retort, etc.)
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.

Displacement System, Tar
Semet-Solvey Engr. Corpn.

Door, Clean-out
Baker Iron Works.
Semet-Solvay Engr. Corpn.

Drills
Ingersoll-Rand Co.
Mueller Co.

Drill Pipe—Iron
South Chester Tube Company

Drill Pipe—Steel
South Chester Tube Company

Dryers—Domestic Laundry, Commercial Laundry. Laboratory, Industrial.
The W. E. Lamneck Co.

Dryers—Blue Prints, Photograph film, etc.
The W. E. Lamneck Co.

Dryers—Dehydrating Fruits,
The W. E. Lamneck Co.

Elevators
Baker Iron Works.

Engineers and Engineering Service
J. A. Campbell
Charles R. Collins.
J. B. Gill Corporation.
The Bartlett Hayward Co.
A. R. Maas, Laboratories.
Smith-Emery Co.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Engines, Diesel
The C. & G. Cooper Co.

Engines, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Oil
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Steam
Ingersoll-Rand Co.

Evaporating Apparatus
The Bartlett Hayward Co.
C. F. Braun & Co.
United States Cast Iron Pipe and Foundry Co.
Southwestern Engineering Corp.

Excavators, Ditch and Trench
The Cleveland Trencher Co.

Exchangers, Heat
Baker Iron Works.
C. F. Braun & Co.
J. A. Campbell
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Exhausters
Ingersoll-Rand Co.
United States Cast Iron Pipe and Foundry Co.

Experimental Apparatus
The Bartlett Hayward Co.
Pacific Meter Works.

Extractors
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.

Faucets, Drain
Mueller Co.

Felt—Deadening
Pioneer Paper Company.

Filters
Oliver Continuous Filter Co.
United States Cast Iron Pipe and Foundry Co.

Fire Clay and Products
Gladding, McBean & Co.
Stockton Fire Brick Co.

Fire Brick Contractors
J. T. Thorpe & Son, Inc.
Stockton Fire Brick Co.

Fittings
The Bartlett Hayward Co.
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Fixtures, Lighting (Domes, Portables, etc.)
C. B. Babcock Co.
Welsbach Company.

Feed Water Heaters
C. F. Braun & Co.
Southwestern Engineering Corp.

Fire Brick
Gladding, McBean & Co.
Stockton Fire Brick Co.
Semet-Solvay Engr. Corpn.

Flanges
Pittsburgh Equitable Meter Co
Semet-Solvay Engr. Corpn.
Westcott & Greis, Inc.

Flooring—Industrial
Pioneer Paper Company.

Forgings
Baker Iron Works.
Payne Furnace & Supply Co.
Pacific Gas Heating Co.
Geo. D. Roper Corporation.
J. T. Thorpe & Son, Inc.

Furnaces, Floor
Magic Way Company
Payne Furnace & Supply Co.
Pacific Gas Heating Co.

Furnaces, Heating
Payne Furnace & Supply Co.
Pacific Gas Heating Co.
Magic Way Company.

Furnaces, Lead Melting
C. B. Babcock Co.
The Estate Stove Co.
Johnson Gas Appliance Co.
Mueller Co.
Payne Furnace & Supply Co.

Gas Analysis Apparatus
The Foxboro Co., Inc.
Fort Worth Laboratories.
Jensen Instrument Co.
Pacific Meter Works.

Gas Masks
Safety Gas Main Stopper Co.

Gas Main Tapping & Drilling Machines
Mueller Co.

Gaskets
The E. A. Key Company
Pittsburgh Equitable Meter Co
Safety Gas Main Stopper Co.
Semet-Solvay Engr. Corpn.

Gasket Compound
W. P. Fuller & Co.
E. A. Key Co.

Gasometer
Pacific Meter Works.
Semet-Solvay Engr. Corpn.

Gas Pipe Line Construction
Fort Worth Laboratories.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Gauges
The Foxboro Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Semet-Solvay Engr. Corpn.
Westcott & Greis, Inc.

Gauges, Steam
Jensen Instrument Co.
Semet-Solvay Engr. Corpn.

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge.

Situations Wanted

Note: *Western Gas* will publish free of charge, under this heading, advertisements of situations wanted. Maximum length, 50 words; additional space at classified rates five cents per word per insertion. Copy should be neatly typewritten on one side of paper only, and should be mailed to reach *Western Gas* not later than the 20th day of the month prior to publication date.

Distribution Superintendent with small or medium sized company. Thirty-three years old. Fourteen years' experience with manufactured and natural gas. Last employed as District Manager. Best of references. A-12, care of *Western Gas,* 124 West Fourth St., Los Angeles.

Woman applicant with over nine years' secretarial and stenographic experience desires similar work in southern California. Satisfactory references from utility field can be furnished. Available for position after March 1. Address A-13, care of *Western Gas,* 124 West Fourth St., Los Angeles.

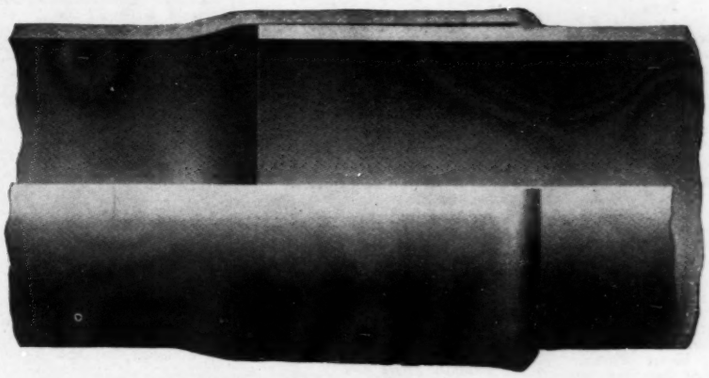
NEW TOWNS ON COMMUNITY NATURAL GAS CO. LINES

The Community Natural Gas Company of Dallas, Texas, has completed the piping of gas into the following Texas towns: Windon, Roxton, Drookston, Petty, Duncanville, Brittain, Lillian, Godley, Calvert, Hearne, Reagan, Riesel and Ogelsby. Gas will be served these towns from the lines of the Lone Star Gas Company.

The Lone Star Gas Company, of Dallas, Texas, is planning to extend a 16-inch gas line from the Grady County, Texas, gas field to Pernell in Garvin County, a distance of 40 miles, to connect with the mains there which supply Dallas, Ft. Worth and other Texas points and towns in Oklahoma with natural gas. The construction of the line, which will cost approximately $1,500,000, will be begun in 60 days. The line will also tap the Chickasha gas field. The gas haul from the well in Grady County to Dallas will be about 215 miles.

SIOUX CITY UTILITY BOUGHT BY IOWA PUBLIC SERVICE CO.

Announcement has been made of the purchase by the Iowa Public Service Company of the Sioux City Gas & Electric Company from the United Gas Improvement Company of Philadelphia. Several other U. G. I. holdings in Iowa were included in the transaction. Don Stearns, president of the Iowa Public Service Company, continues to head the Iowa properties of the organization, which has general offices at Fort Dodge, Iowa. More than 200 towns and cities in Iowa are served gas or electric light and power by Iowa Public Service.



(Patented)

Hydrostatic Tests Prove Superiority of "ASTCO" Seamless Steel Line Pipe

In exhaustive tests made under normal working conditions, where all joints were welded by a mechanic of only average skill, "ASTCO" Seamless Steel Slip Joint Line Pipe has definitely demonstrated its superior strength and higher resistance to leakage.

In nine tests, only two tubes leaked at the welds, these leaks occuring at pressures of 4,125 and 3,129 pounds per square inch respectively. In the tests for strength, abrasion of the welds occurred at pressures varying from 2,845 up to 5,120 pounds per square inch.

From these tests it is evident that "ASTCO" Slip Joint Line Pipe offers a safety factor of from 2.5 to 4 for working pressures up to 1,150 pounds per square inch—more than ample for any service encountered.

The complete results of these tests will be furnished to any interested company on request.

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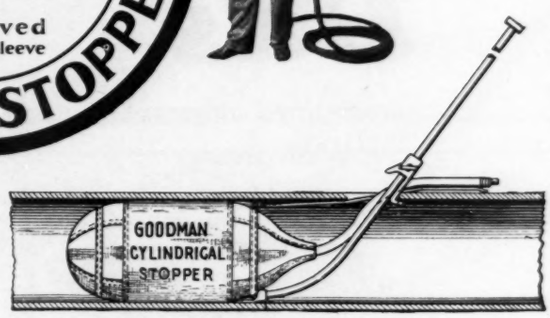

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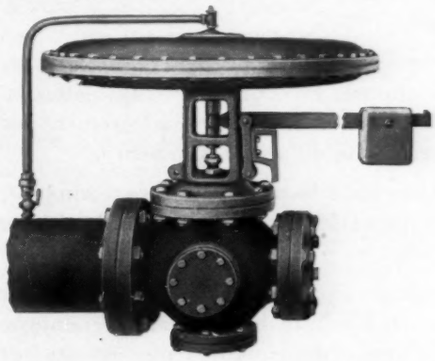

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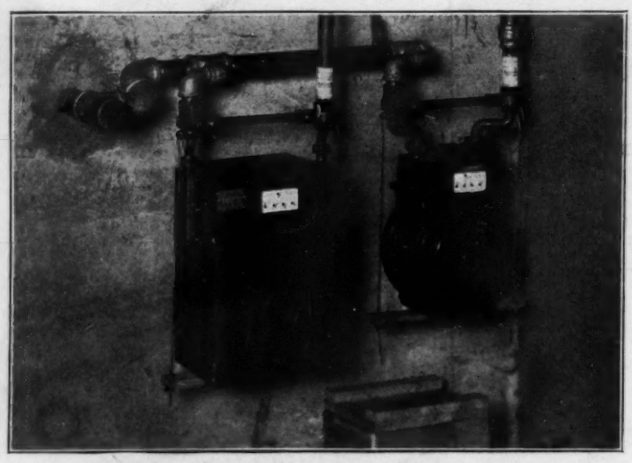

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